Supplementary Information
Lipids as Versatile Solvents for Chemical Synthesis

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General considerations

Commercially available starting materials, reagents, catalysts and anhydrous and degassed solvents were used without further purification. Flash column chromatography was performed with Merck silica gel 60 (230-400 mesh). The solvents for column chromatography were distilled before use (in case of technical solvents). Thin layer chromatography was carried out using Merck TLC Silica gel 60 F_{254} and visualized by short-wavelength ultraviolet light or by treatment with potassium permanganate ($KMnO_4$) stain. ^{1}H, ^{13}C and ^{19}F NMR spectra were recorded on a Bruker Avance 400 MHz at 20 ºC. All ^{1}H NMR spectra are reported in parts per million (ppm) downfield of TMS and were measured relative to the signal for $CHCl_3$ (7.26 ppm). All ^{13}C NMR spectra were reported in ppm relative to residual $CDCl_3$ (77.20 ppm) and were obtained with ^{1}H decoupling. Coupling constants, *J*, are reported in Hertz (Hz). High-resolution mass spectra (HRMS) were recorded from methanol solutions on an LTQ Orbitrap XL (Thermo Scientific) either in negative or in positive electrospray ionization (ESI) mode.

Triglycerides, phospholipids and related lipids possess a varying number of internal double bonds. The fact that we could develop highly efficient methodologies for a range of different cross-coupling reactions in vegetable oils, avoiding side processes involving the solvent (including the Heck coupling), is intriguing. The Heck cross-coupling reaction is known to be quite sensitive to steric hindrance, which can be one of the reasons for the efficiency of vegetable oils and related systems as solvents. Thus, control experiments with internal olefins or substituted styrenes, using the best conditions for Heck coupling, provided partial recovery of starting materials and reductive homocoupling of the aryl halide (Scheme 4, **11i**,**j**).
The solvent was not affected in a series of control experiments, where the best conditions for cross-couplings described above were run in rapeseed oil in the presence of only 3,5-bis(trifluoromethyl)bromobenzene (**2a**). In all cases, we observed partial recovery of the starting aryl halide alongside the biaryl formed from the reductive homocoupling of the aryl halide. ^{1}H, ^{13}C and ^{19}F NMR spectra of the solvent before and after the control experiments were identical.
As lipids/oils consist of esters, decomposition via saponification is another possible side reaction. In our work saponification was observed only in the presence of water or strong bases such as alkoxides. Considerable amount of saponification is easily detectable, as the liquid phase turns into a wax-like solid when a reaction mixture is cooled. This phenomenon was never seen for anhydrous conditions or bases like carbonates, fluorides, acetates and amines, which are commonly used for cross-coupling reactions, including the present work.

The following oils were bought from Sigma Aldrich and are available worldwide: Rapeseed oil from *Brassica rapa* (CAS: 8002-13-9); Sunflower seed oil from *Helianthus annuus* (CAS: 8001-21-6); Soybean oil from *Glycine max* (CAS: 8001-22-7); Fish oil from menhaden (CAS: 8002-50-4).
The rest of vegetable oils and butter were bought from local groceries (Norway) and are available in Nordic countries (for detailed descriptions see Figures S1-S16). Before use, all oils were treated with anhydrous $CaCl_2$ powder for 24h (butter and coconut oil were melted during the treatment), which was followed by hot filtration to remove $CaCl_2$ (along with NaCl in case of butter). The resulting oils were

degased and stored over activated molecular sieves (4Å) under Ar atmosphere (for detailed descriptions see Figures S17-S19).

Natural waxes are commercially available and were bought from the following international suppliers: Carnauba wax No. 1 yellow (Sigma Aldrich, CAS: 8015-86-9); Beeswax (Sigma Aldrich, CAS: 8012-89-3); Lanolin (Alfa Aesar, CAS: 8006-54-0). After the delivery, these waxes were stored under Ar atmosphere.

For the production of waste rapeseed oil, we fried potatoes in virgin rapeseed oil from the brand Coop. Frying was performed under air at 130 ^{o}C. After every 2 hours, a portion of waste rapeseed oil was separated and filtered through a short plug of silica gel. Accordingly, we generated four fractions of waste rapeseed oil, which were used for frying potatoes for 2, 4, 6 and 8 hours respectively. Obtained waste rapeseed oils were stored under air and used for Suzuki-Miyaura and Heck cross-couplings without additional tretment. Products obtained in waste rapeseed oils can be isolated using column chromatography. For more details on the production and processing of waste rapeseed oils, see Figures S30-S32.

Monoterpenes used for preparative column chromatography are commercially available and were bought from the following international suppliers: (−)-α-Pinene (Sigma Aldrich, CAS: 7785-26-4, Cat No: W290203-8KG-K); 3-Carene (Sigma Aldrich, CAS: 13466-78-9, Cat No: W382108-4KG); Dipentene (Sigma Aldrich, CAS: 138-86-3, Cat No: 334111-4L); (*R*)-(+)-Limonene (Sigma Aldrich, CAS: 5989-27-5, Cat No: W263303-1KG-K); γ-Terpinene (Sigma Aldrich, CAS: 99-85-4, Cat No: W355909-1KG-K); α-Terpinene (Sigma Aldrich, CAS: 99-86-5, Cat No: W355801-4KG-K); Terpinolene (Sigma Aldrich, CAS: 586-62-9, Cat No: W304603-4KG-K); Sabinene (Sigma Aldrich, CAS: 3387-41-5, Cat No: W530597-1KG-K); Myrcene (Sigma Aldrich, CAS: 123-35-3, Cat No: W276200-1KG-K); α-Phellandrene (Sigma Aldrich, CAS: 99-83-2, Cat No: W285609-1KG-K). Monoterpenes were evaporated before use.

Description of oils from grocery

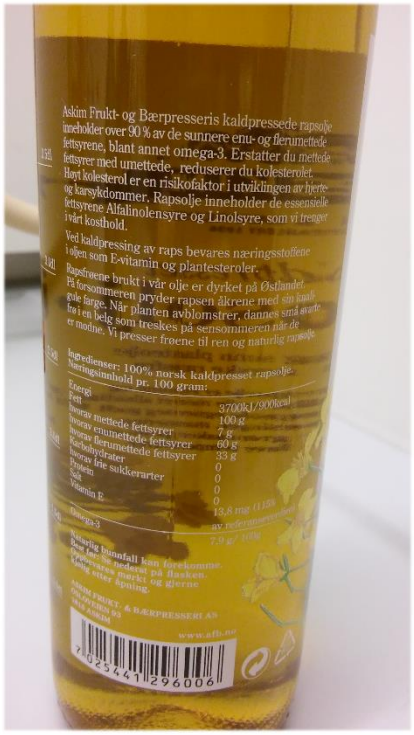


Figure S1. Rapeseed oils and rapeseed oil from the brand Askim.

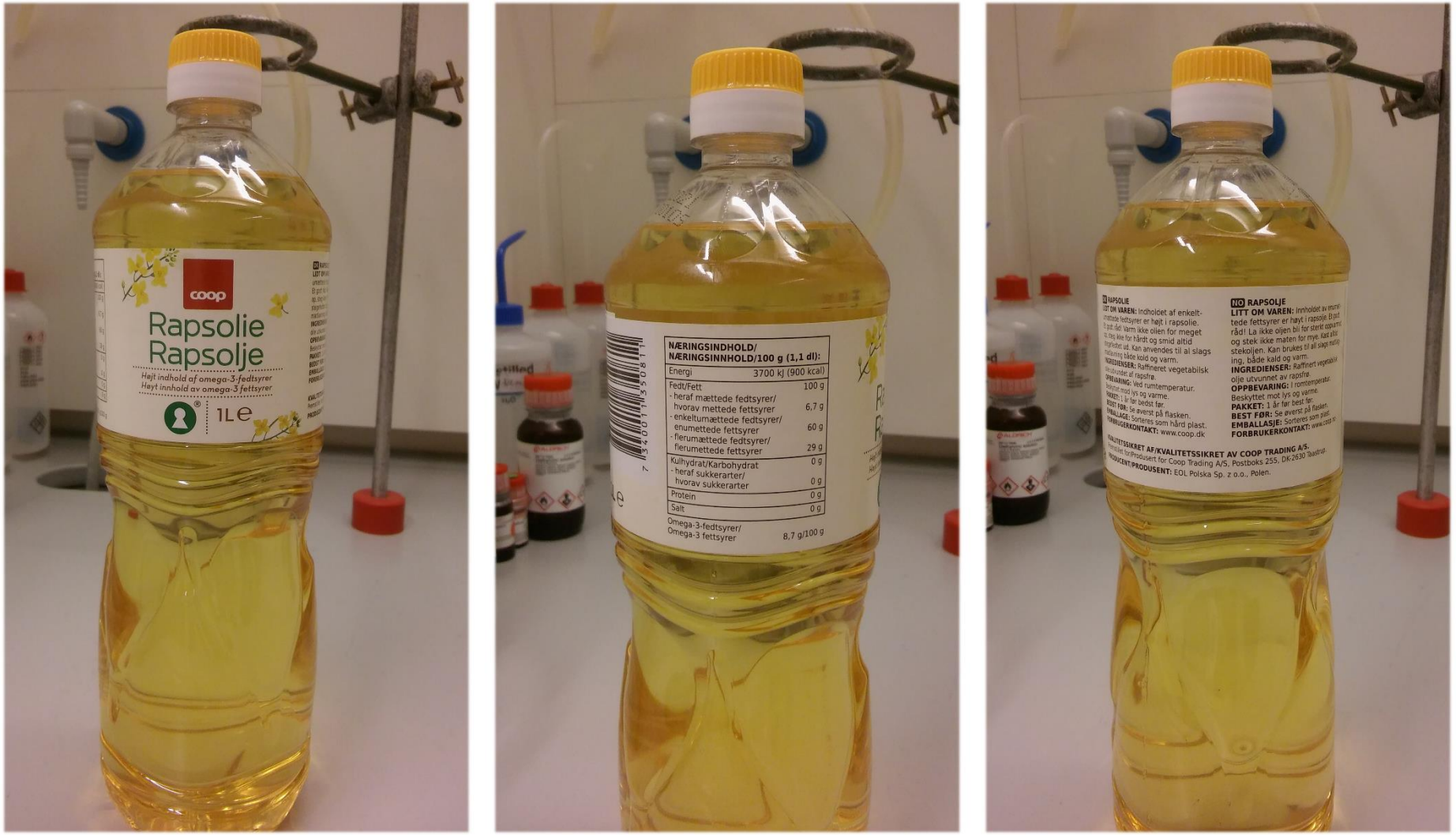


Figure S2. Rapeseed oil from the brand Coop.

Figure S3. Rapeseed oil from the brand Odelia.

Figure S4. Rapeseed oil from the brand Rema.

Figure S5. Rapeseed oil from the brand Anglamark.

Figure S6. Sunflower oil.

Figure S7. Olive oil.

Figure S8. Soybean oil.

Figure S9. Corn oil.

Figure S10. Avocado oil.

Figure S11. Sesame oil.

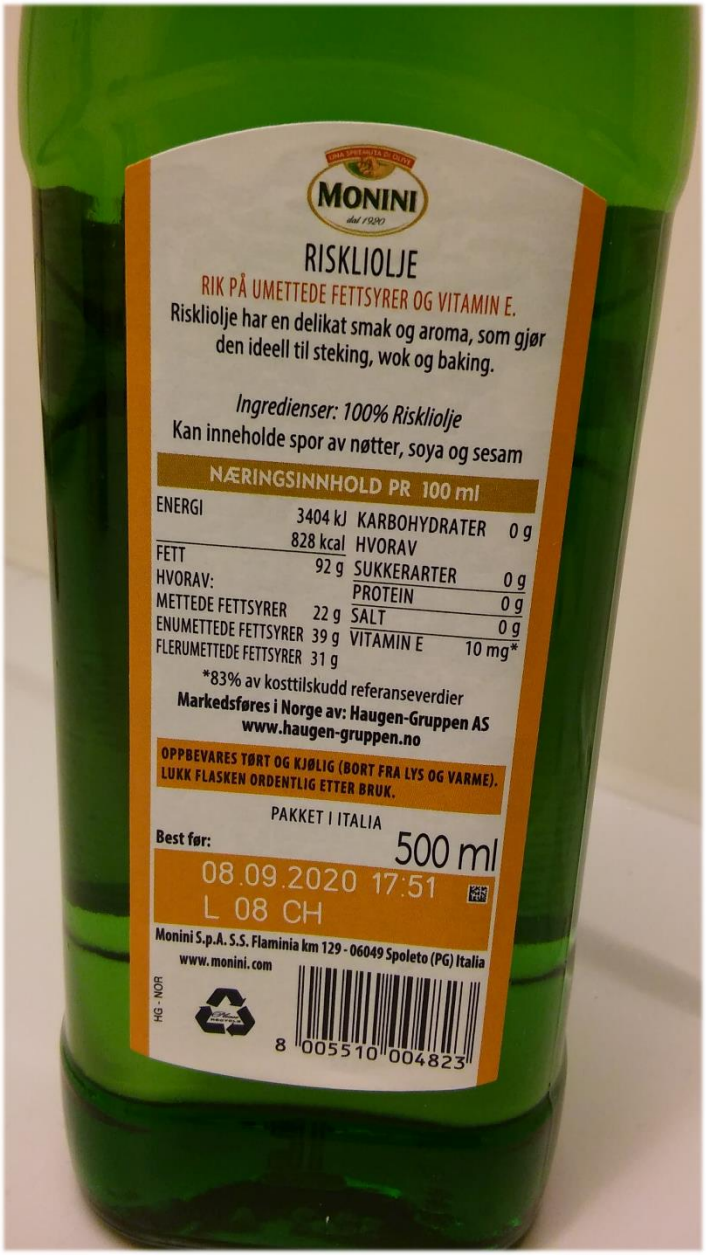


Figure S12. Rice bran oil.

Figure S13. Mixture of oils consisting of rapeseed oil (60%), sunflower oil (25%) and olive oil (15%).

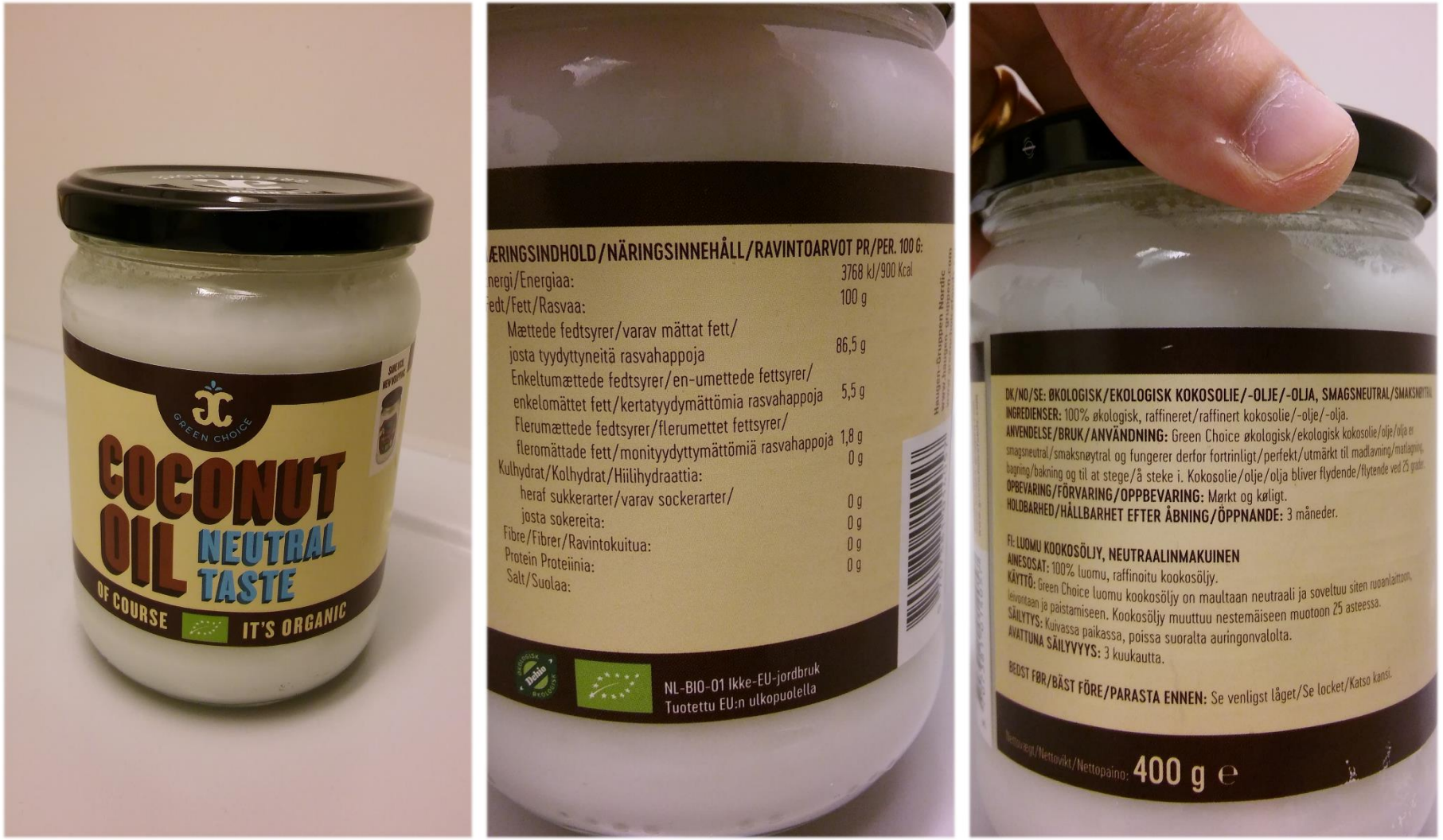


Figure S14. Coconut oil.

Figure S15. Butter.

Figure S16. Fish oil.

Drying and storage of vegetable oils

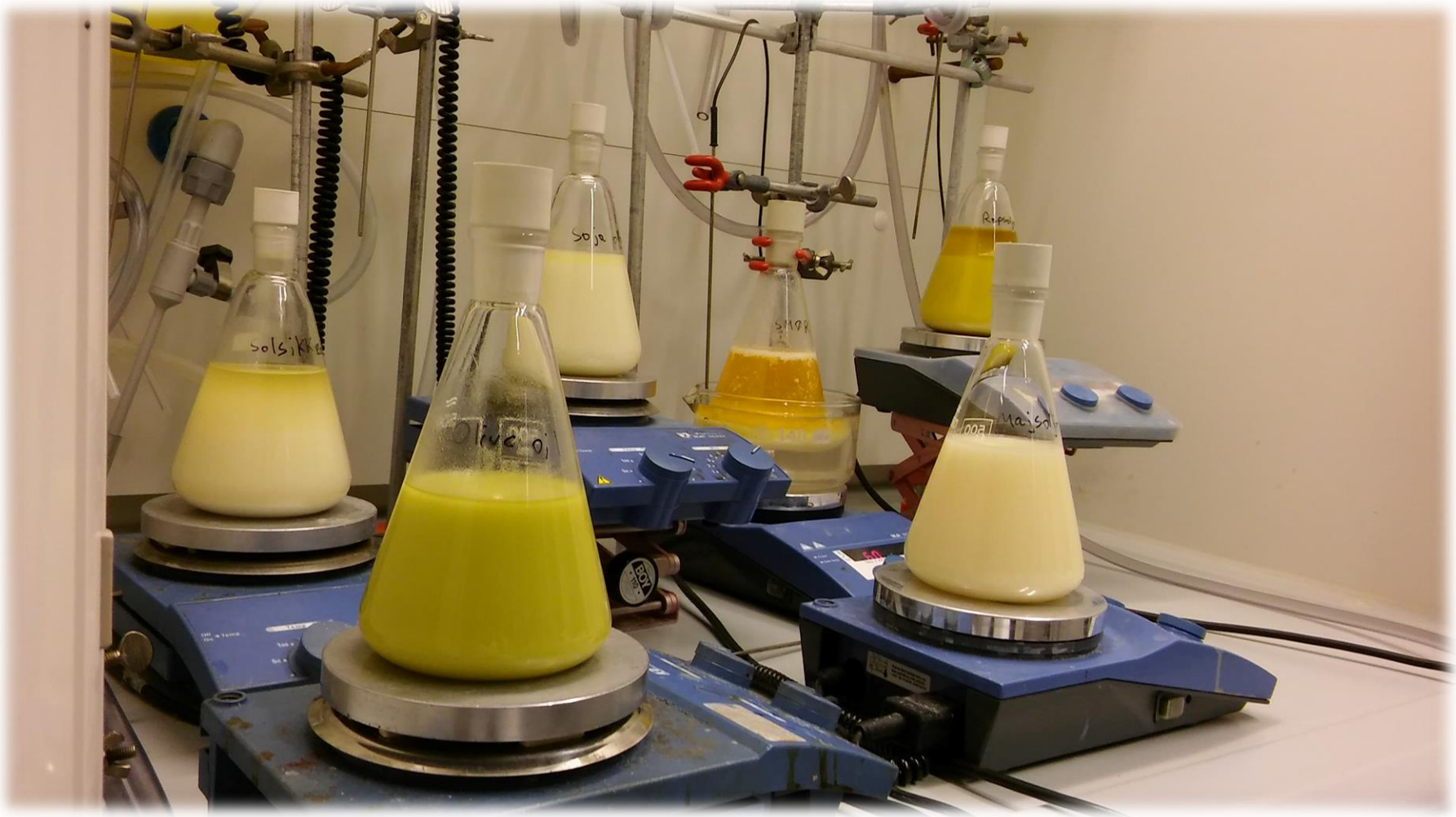


Figure S17. Treatment of oils with anhydrous $CaCl_2$ powder.

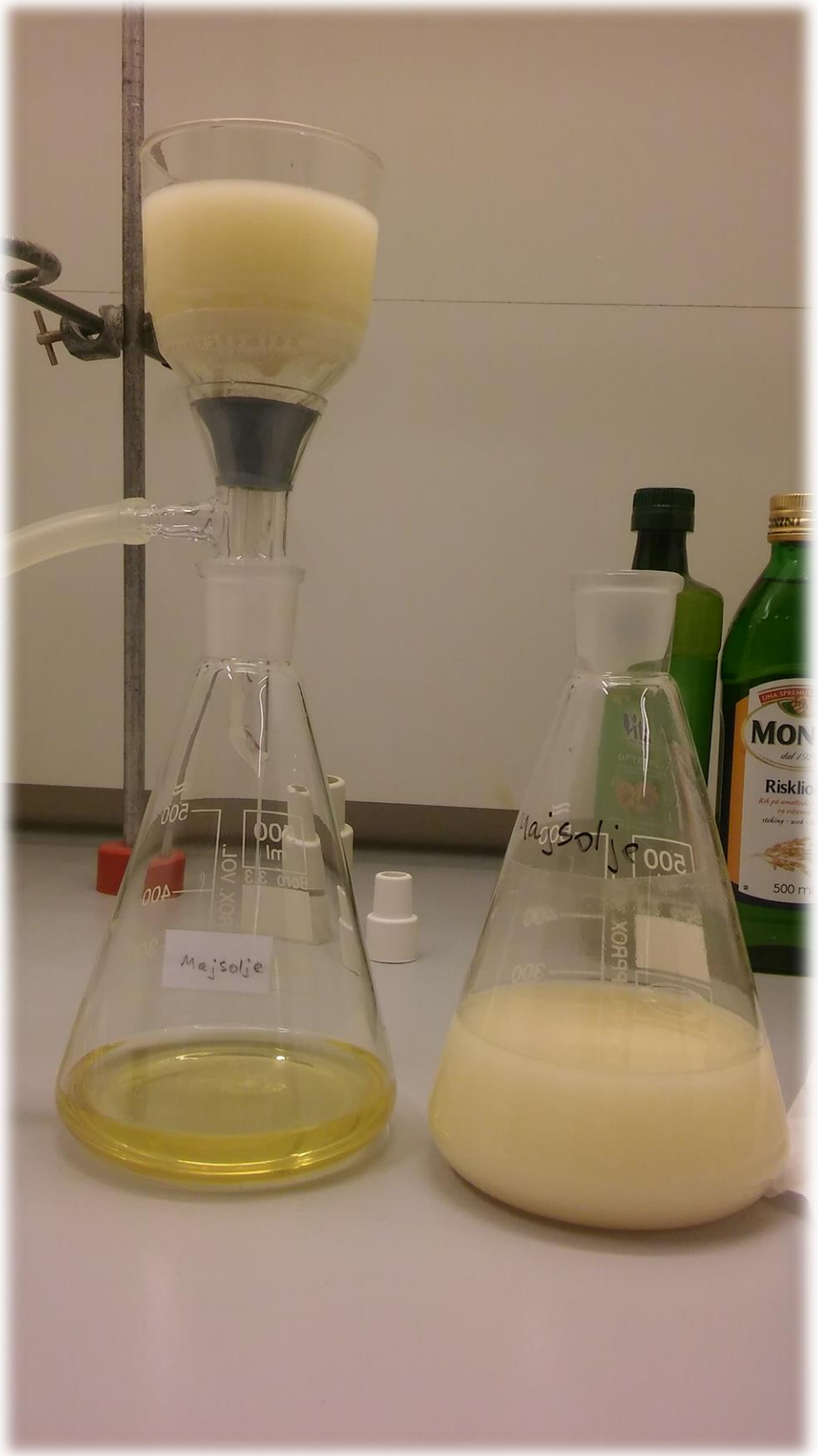


Figure S18. Hot filtration of corn oil from $CaCl_2$.

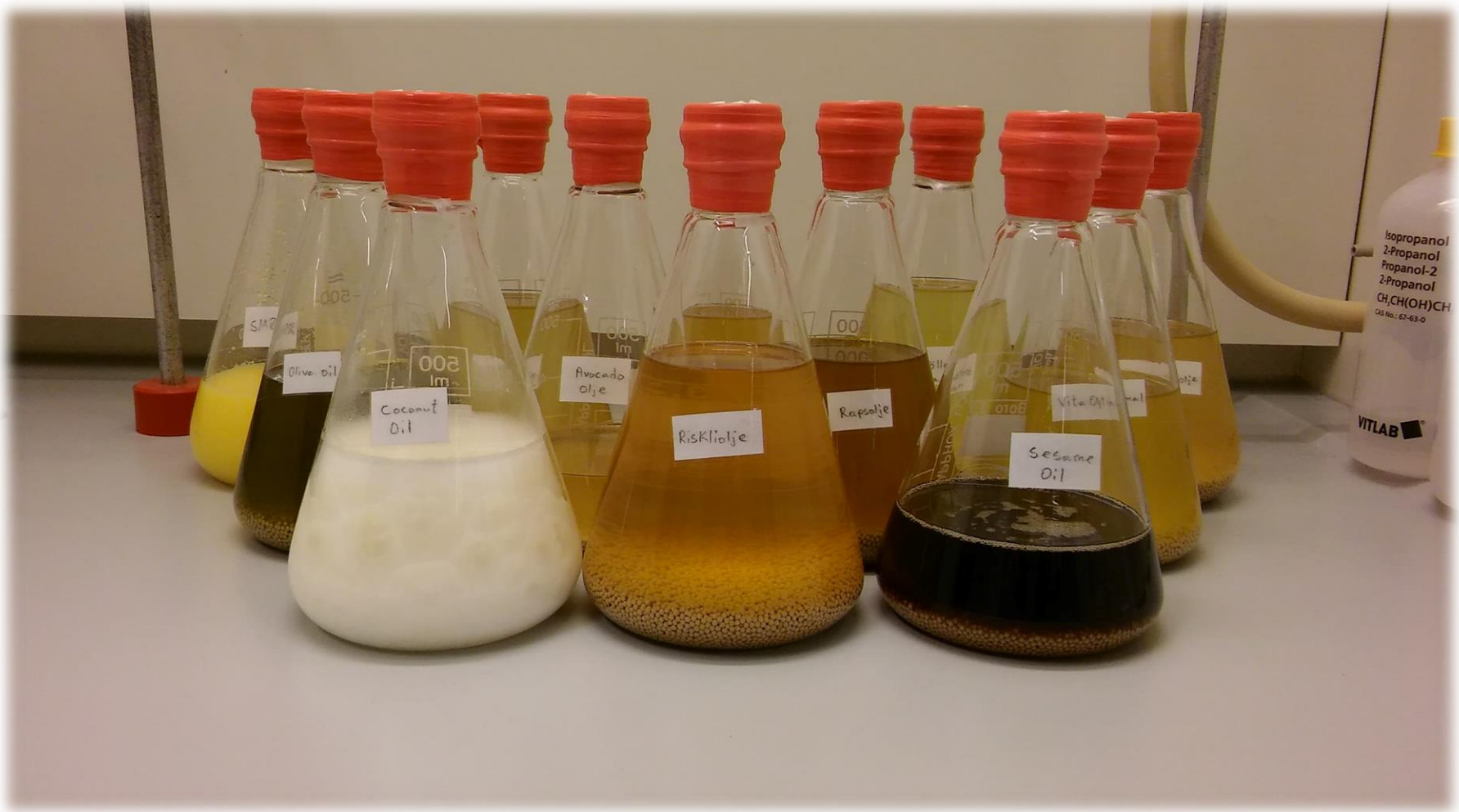
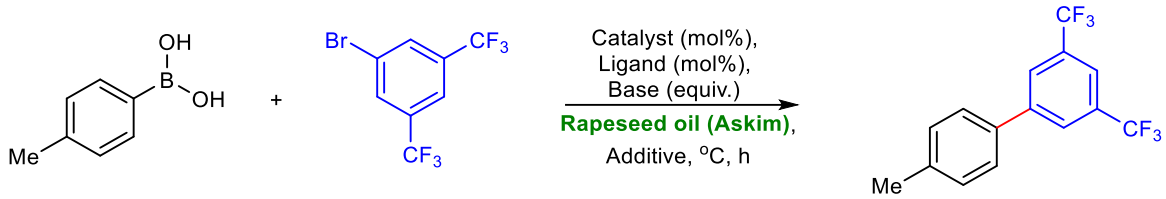


Figure S19. Degased oils over activated molecular sieves (4Å) and under Ar atmosphere.

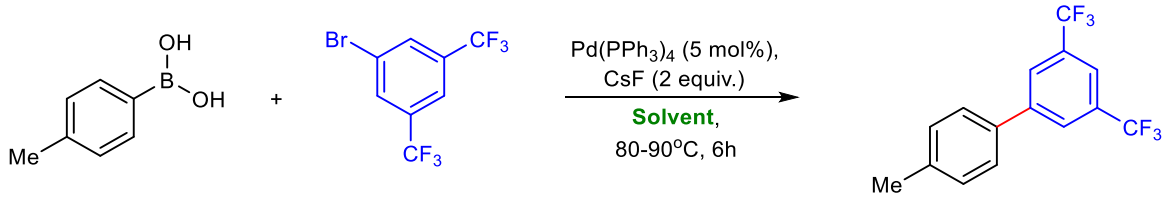
General experimental procedures for optimization of cross-couplings

Optimization of Suzuki-Miyaura coupling in rapeseed oil from Askim. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with 4-tolylboronic acid (1 equiv., 0.368 mmol), corresponding Pd-complex (0.4-5 mol%), ligand (0-12 mol%) and the base (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL), corresponding additive (0-0.3 mL) and 3,5-bis(trifluoromethyl)bromobenzene (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 20-110 °C for 6-24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of solvents for Suzuki-Miyaura coupling. For general setup, see Figures S20-S27.

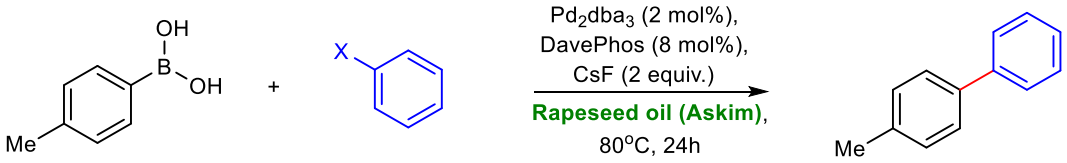


Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with 4-tolylboronic acid (1 equiv., 0.368 mmol), $Pd(PPh_3)_4$ (5 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added corresponding solvent (2 mL)[1] and 3,5-bis(trifluoromethyl)bromobenzene (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80-90 °C for 6 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL[2] of $CDCl_3$ (or CCl_4). In case of 2MeTHF, acetal, dioxane, toluene or DMF, the solvent was evaporated before addition of the internal standard and chloroform. The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

[1] Beeswax and Carnauba wax where weighed inside of glove box like other solids (2g). Lanolin, Butter and coconut oil were melted before addition (80 °C). In general, vegetable oils are viscous liquids. The transfer of vegetable oils from the main container into the reaction vessel with the syringe can be greatly facilitated by heating the oil to 50-80 °C.

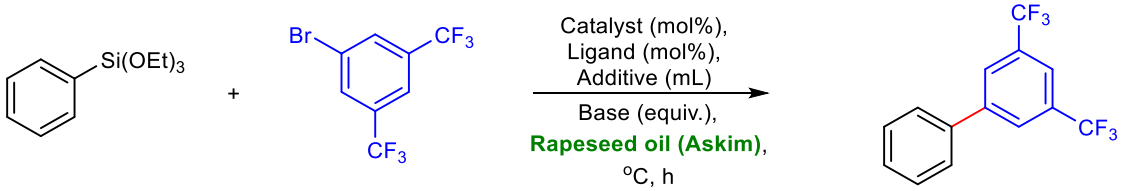
[2] In case of Beeswax and Carnauba wax, the mixture was diluted with 6 mL of $CDCl_3$ (CCl_4).

Screening of electrophiles for Suzuki-Miyaura coupling. For general setup, see Figures S20-S27.



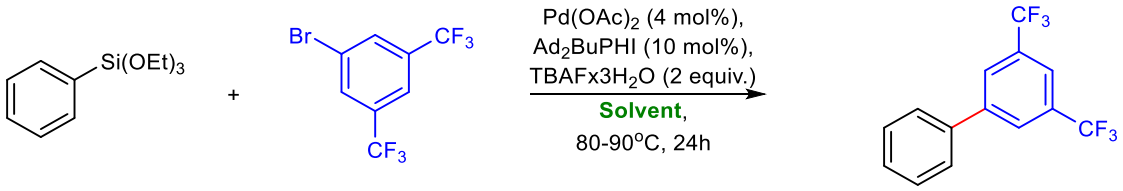
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with 4-tolylboronic acid (1 equiv., 0.368 mmol), Pd_2dba_3 (2 mol%), DavePhos (8 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL) and corresponding aryl halide/sulfonate ester[3] (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Optimization of Hiyama coupling in rapeseed oil from Askim. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with corresponding Pd-complex (0.4-4 mol%), ligand (0-10 mol%) and the base (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL), corresponding additive (0-0.2 mL), phenyltriethoxysilane (1 equiv., 0.333 mmol) and 3,5-bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 20-110 °C for 6-24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of solvents for Hiyama coupling. For general setup, see Figures S20-S27.

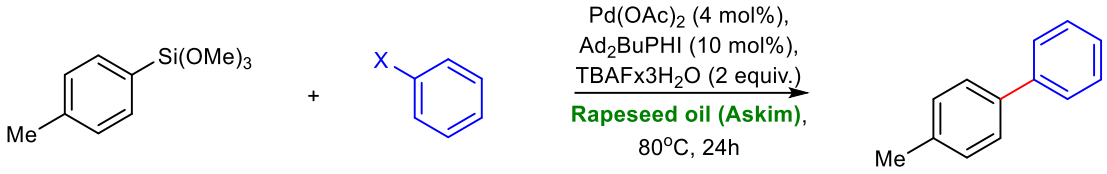


Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with $Pd(OAc)_2$ (4 mol%), Ad_2BuPHI (10 mol%) and $TBAFx3H_2O$ (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added corresponding solvent (2 mL),[1] phenyltriethoxysilane (1 equiv., 0.333 mmol) and 3,5-

[3] Solid electrophiles were weighed in the glove box.

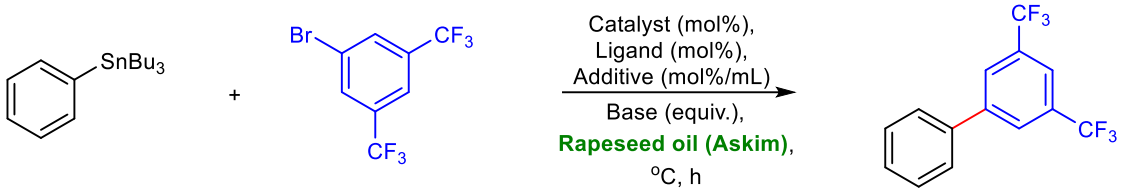
bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80-90 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL[2] of $CDCl_3$ (or CCl_4). In case of 2MeTHF, acetal, dioxane, toluene or DMF, the solvent was evaporated before addition of the internal standard and chloroform. The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of electrophiles for Hiyama coupling. For general setup, see Figures S20-S27.



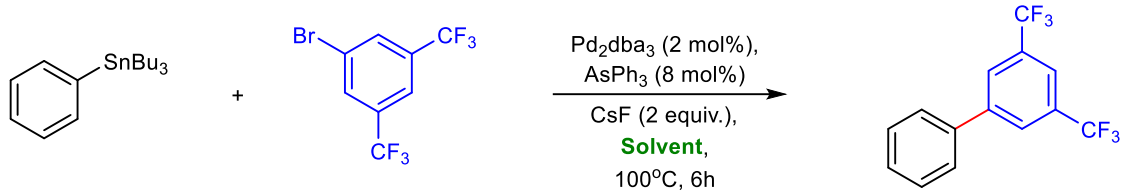
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with $Pd(OAc)_2$ (4 mol%), Ad_2BuPHI (10 mol%) and $TBAFx3H_2O$ (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL), trimethoxy(*p*-tolyl)silane (1 equiv., 0.471 mmol) and corresponding aryl halide/sulfonate ester[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Optimization of Stille coupling in rapeseed oil from Askim. For general setup, see Figures S20-S27.



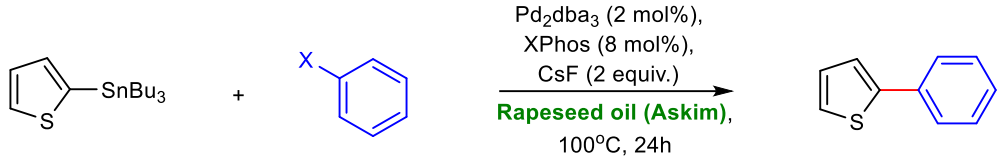
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with corresponding Pd-complex (0.5-2 mol%), ligand (2-8 mol%), CuI (0-4 mol%) and the base (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL), absolute ethanol (0-0.3 mL), tributylphenylstannane (1 equiv., 0.545 mmol) and 3,5-bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 20-100 °C for 6-24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,2,4,5-tetramethylbenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of solvents for Stille coupling. For general setup, see Figures S20-S27.



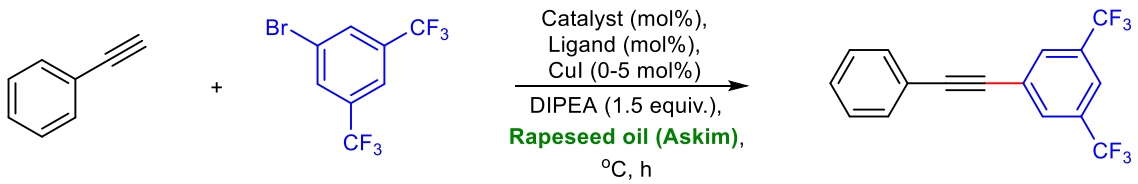
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), $AsPh_3$ (8 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added corresponding solvent (2 mL),[1] tributylphenylstannane (1 equiv., 0.545 mmol) and 3,5-bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 100 °C for 6 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,2,4,5-tetramethylbenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL[2] of $CDCl_3$ (or CCl_4). In case of 2MeTHF, acetal, dioxane, toluene or DMF, the solvent was evaporated before addition of the internal standard and chloroform. The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of electrophiles for Stille coupling. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), XPhos (8 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (2 mL), 2-(tributylstannyl)thiophene (1 equiv., 0.536 mmol) and corresponding aryl halide/sulfonate ester[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 100 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,2,4,5-tetramethylbenzene (1 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

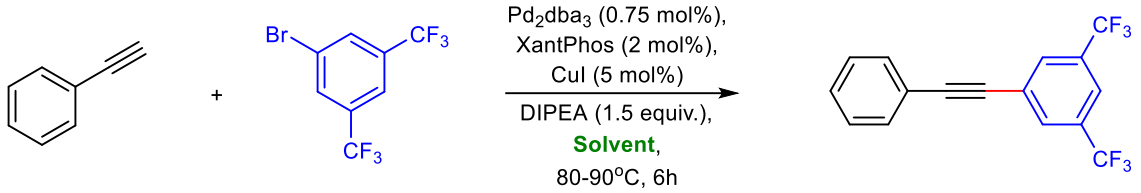
Optimization of Sonogashira coupling in rapeseed oil from Askim. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with corresponding Pd-complex (0.75-3 mol%), ligand (0-6 mol%), CuI (0-5 mol%), phenylacetylene (1 equiv., 0.783 mmol, degassed), 3,5-bis(trifluoromethyl)bromobenzene (1.5 equiv., degassed), rapeseed oil from Askim (2 mL, degassed) and DIPEA (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed

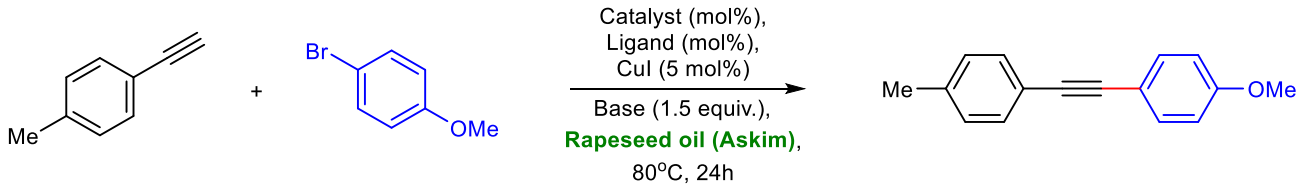
from the glove box and stirred at 20-80 °C for 6-24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of solvents for Sonogashira coupling. For general setup, see Figures S20-S27.



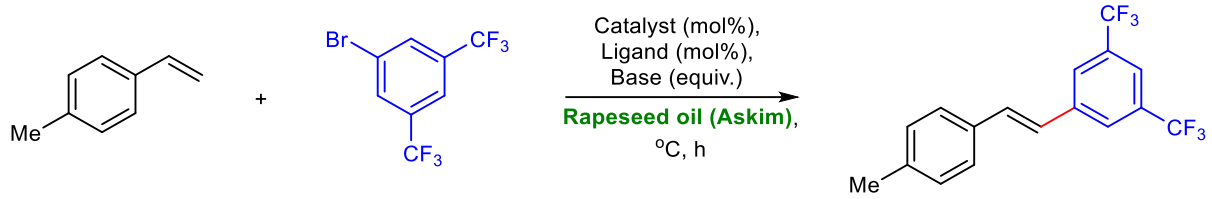
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (0.75 mol%), XantPhos (2 mol%), CuI (5 mol%), phenylacetylene (1 equiv., 0.783 mmol, degassed), 3,5-bis(trifluoromethyl)bromobenzene (1.5 equiv., degassed), corresponding solvent (2 mL, degassed)[1] and DIPEA (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed from the glove box and stirred at 80-90 °C for 6 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL[2] of $CDCl_3$ (or CCl_4). In case of 2MeTHF, acetal, dioxane, toluene or DMF, the solvent was evaporated before addition of the internal standard and chloroform. The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Optimization of Sonogashira coupling for unactivated aryl halides. For general setup, see Figures S20-S27.



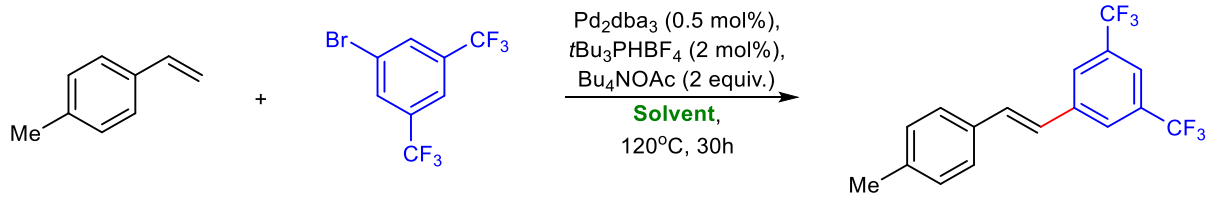
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with corresponding Pd-complex (2-5 mol%), ligand (0-8 mol%), CuI (5 mol%), 4-ethynyltoluene (1 equiv., 0.689 mmol, degassed), 4-bromoanisole (1.5 equiv., degassed), rapeseed oil from Askim (2 mL, degassed) and appropriate base (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed from the glove box and stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of 1,3,5-trimethoxybenzene (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 2 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Optimization of Heck coupling in rapeseed oil from Askim. For general setup, see Figures S20-S27.



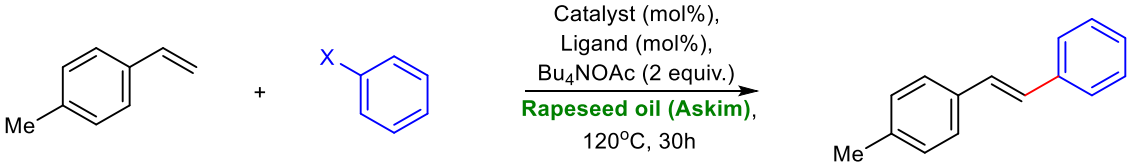
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with corresponding Pd-complex (0.5-5 mol%), ligand (0-12 mol%) and the base (2 equiv.).[4] The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), 4-methylstyrene (1 equiv., 0.846 mmol) and 3,5-bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80-140 °C for 24-48 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of methyl 3,5-dinitrobenzoate (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 3 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of solvents for Heck coupling. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (0.5 mol%), *t*Bu_3PHBF_4 (2 mol%) and Bu_4NOAc (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added corresponding solvent (3 mL),[1] 4-methylstyrene (1 equiv., 0.846 mmol) and 3,5-bis(trifluoromethyl)bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 °C for 30 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of methyl 3,5-dinitrobenzoate (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 3 mL[2] of $CDCl_3$ (or CCl_4). In case of 2MeTHF, acetal, dioxane, toluene or DMF, the solvent was evaporated before addition of the internal standard and chloroform. The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Screening of electrophiles for Heck coupling. For general setup, see Figures S20-S27.



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (0.5-2 mol%), corresponding ligand (2-8 mol%) and Bu_4NOAc (2 equiv.). The flask was sealed with a rubber

[4] Liquid bases were added outside of the glove box following the addition of rapeseed oil.

septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), 4-methylstyrene (1 equiv., 0.846 mmol) and corresponding aryl halide/sulfonate ester[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 ^{o}C for 30 h. Afterwards, the reaction mixture was cooled down, which was followed by addition of methyl 3,5-dinitrobenzoate (0.5 equiv., internal standard), 20 drops of $CHCl_3$ and 3 mL of $CDCl_3$ (or CCl_4). The resulting mixture was thoroughly shaked for 2 minutes than centrifuged. This was followed by NMR analysis of an aliquot taken from the resulting mixture.

Setup of high-throughput screening

Figure S20. Charging of reaction vials with solid reactants and catalyst in the glove box.

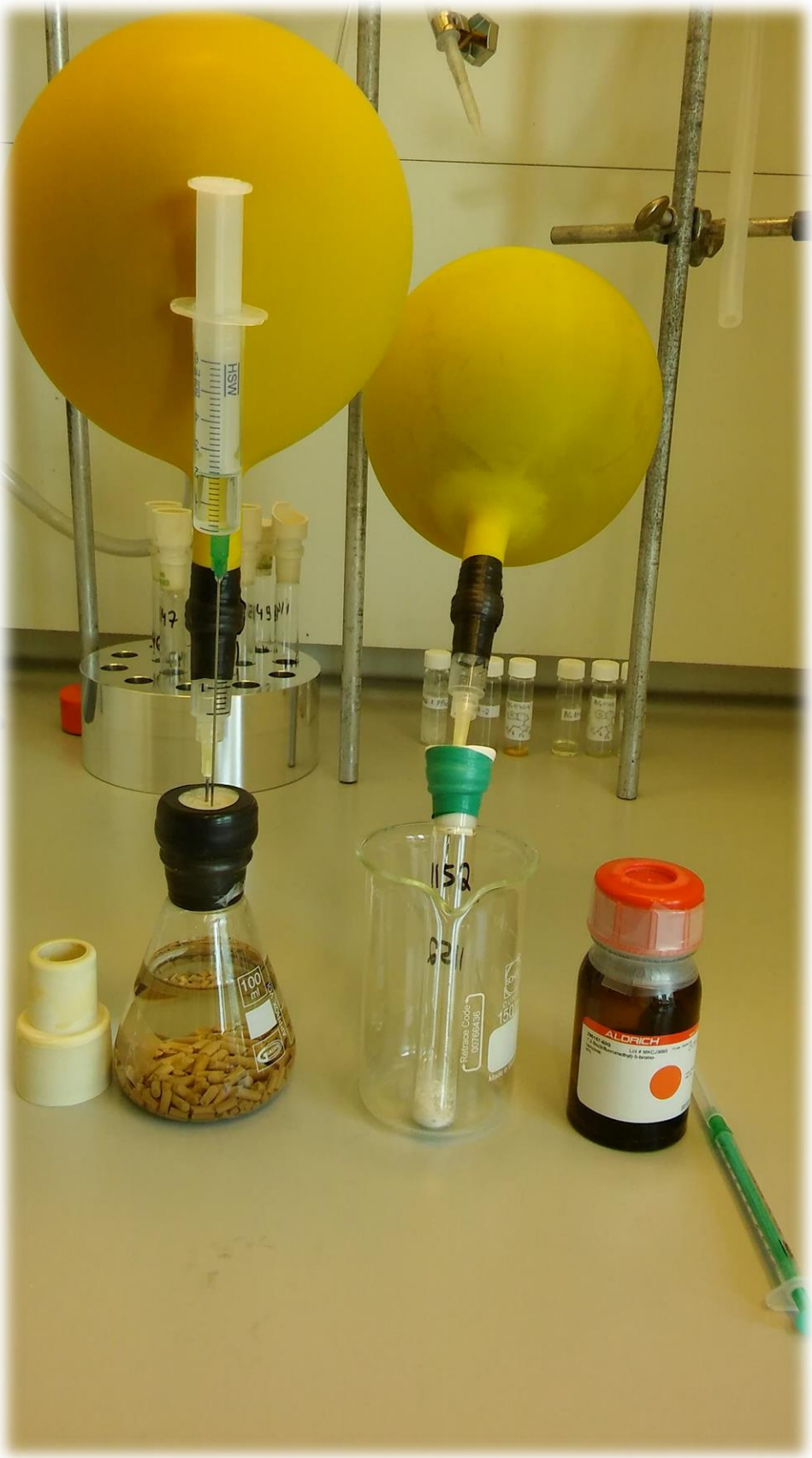


Figure S21. Addition of vegetable oil and liquid reaction components.

Figure S22. Stirring of the reaction mixture at appropriate temperature.

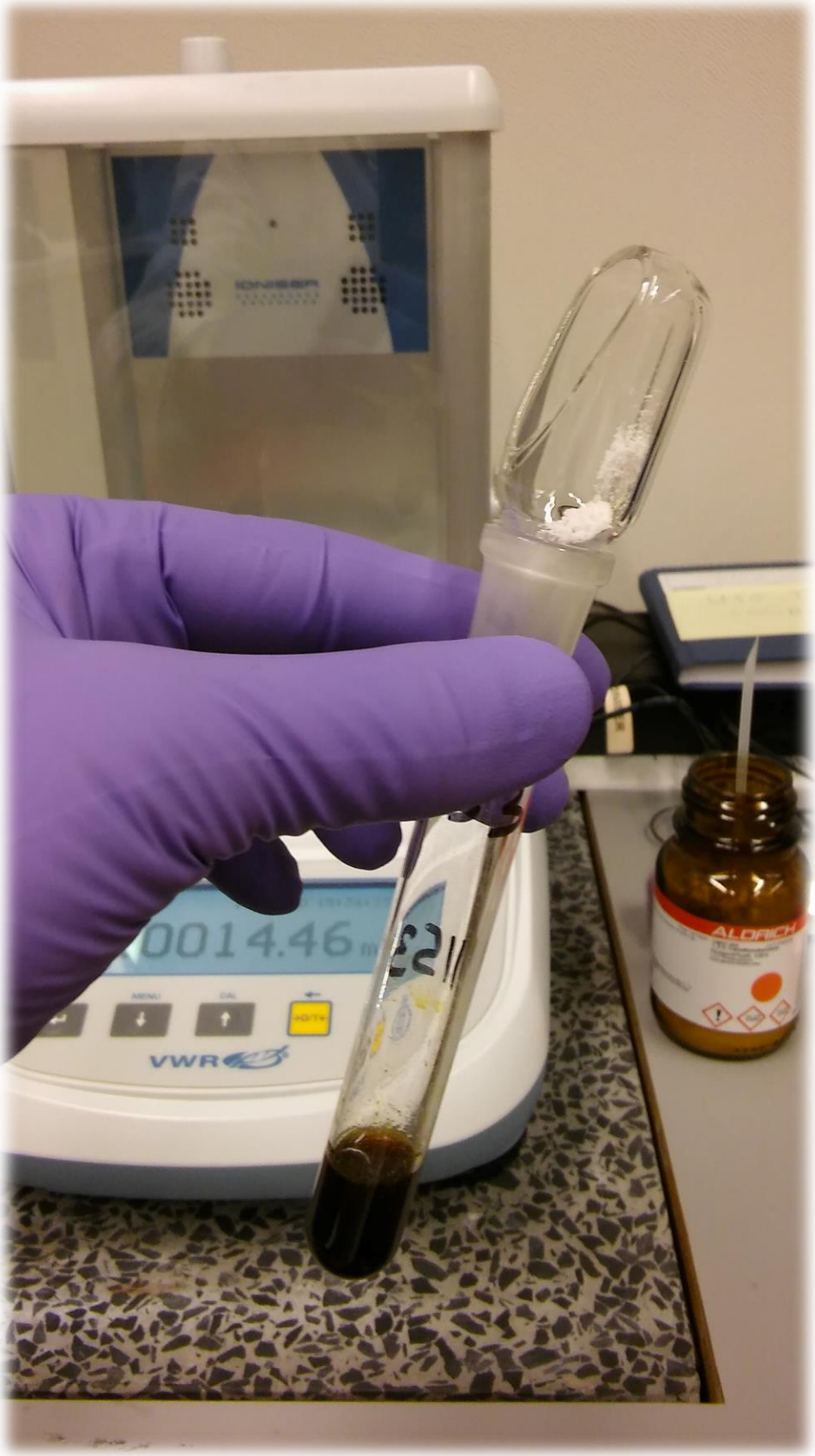


Figure S23. Addition of an internal standard to the reaction mixture at room temperature.

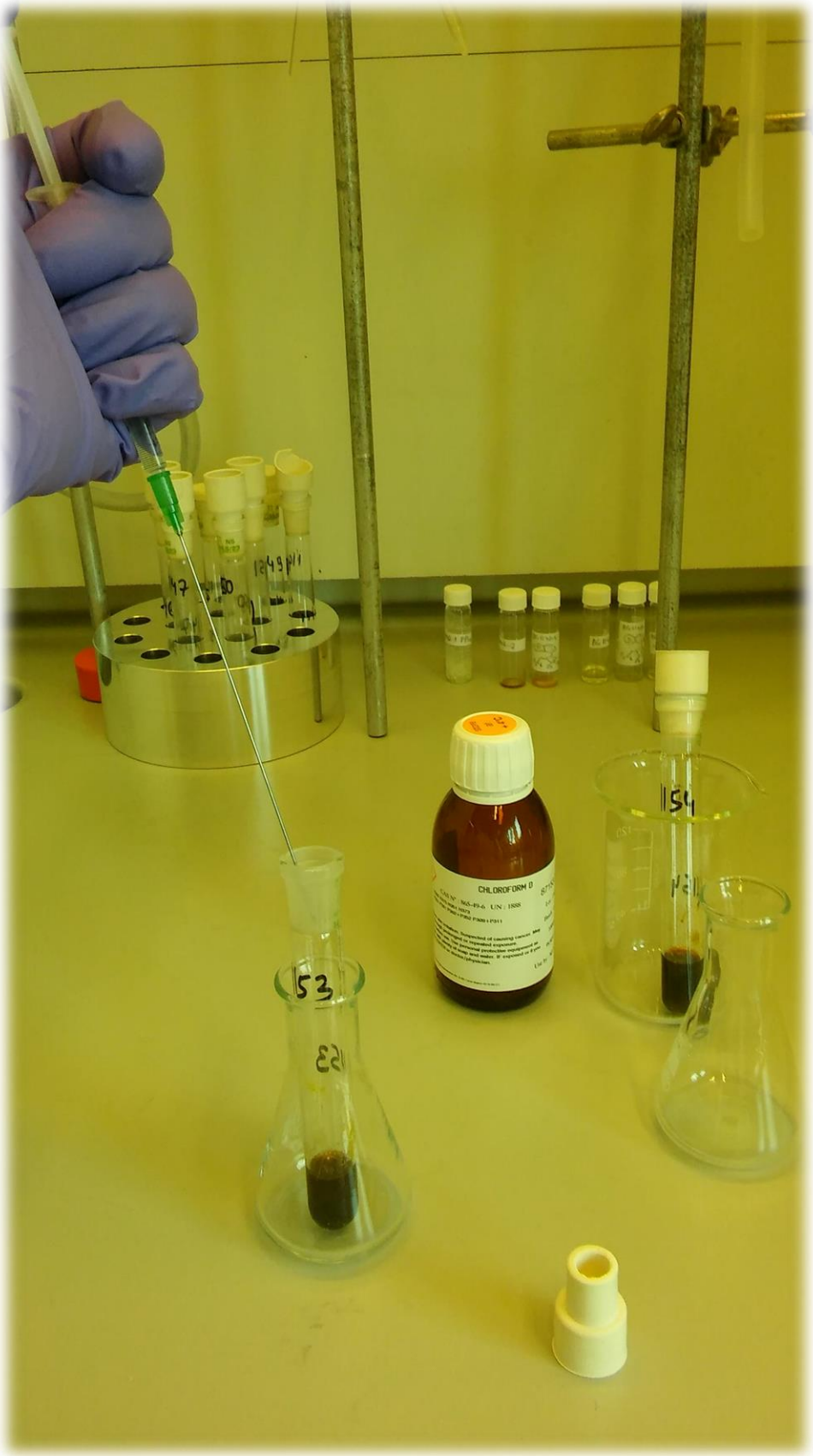


Figure S24. Addition of 20 drops of $CHCl_3$ and $CDCl_3$ (or CCl_4).

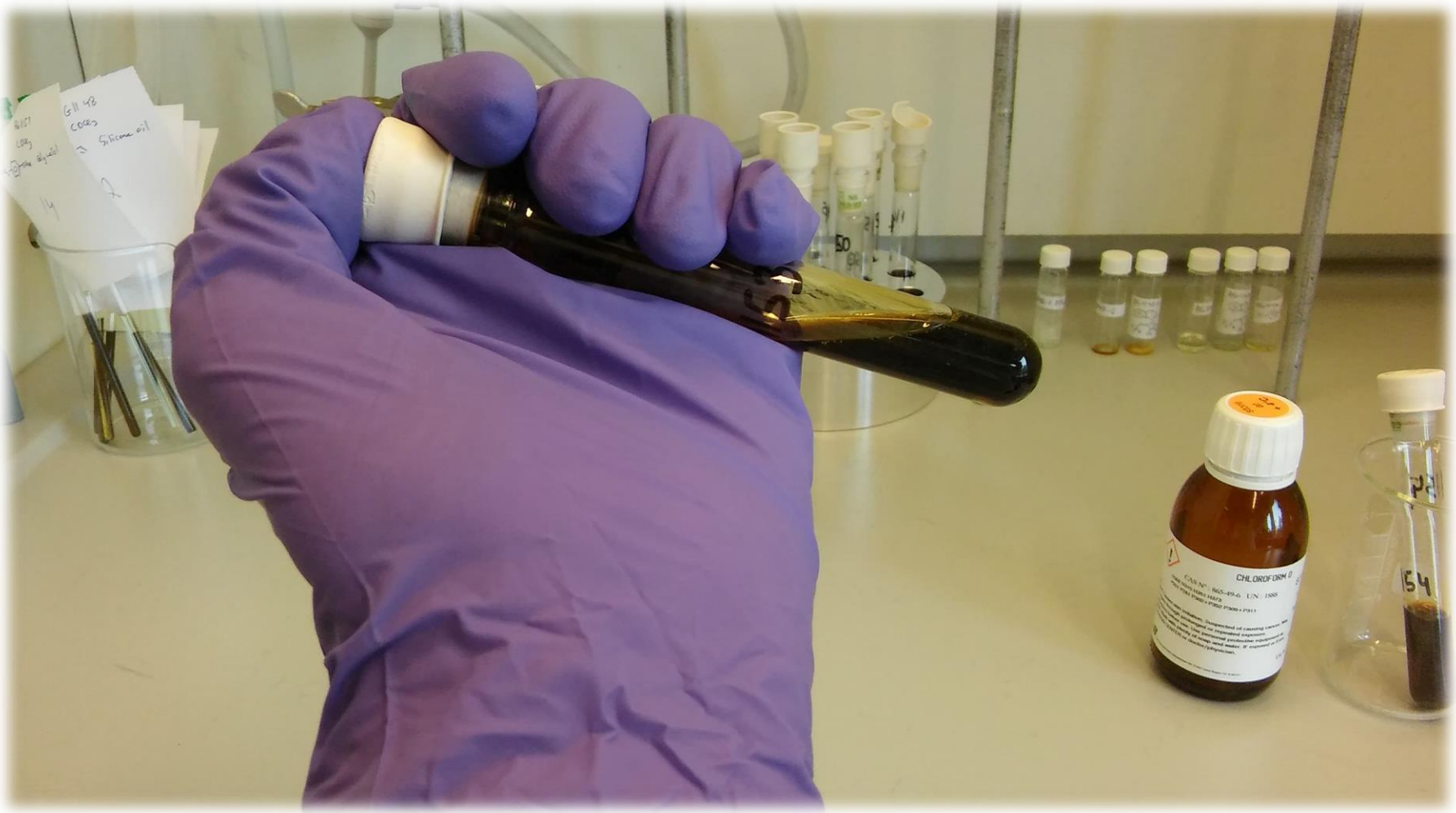


Figure S25. Shaking of the reaction mixture to dissolve all organic matter.

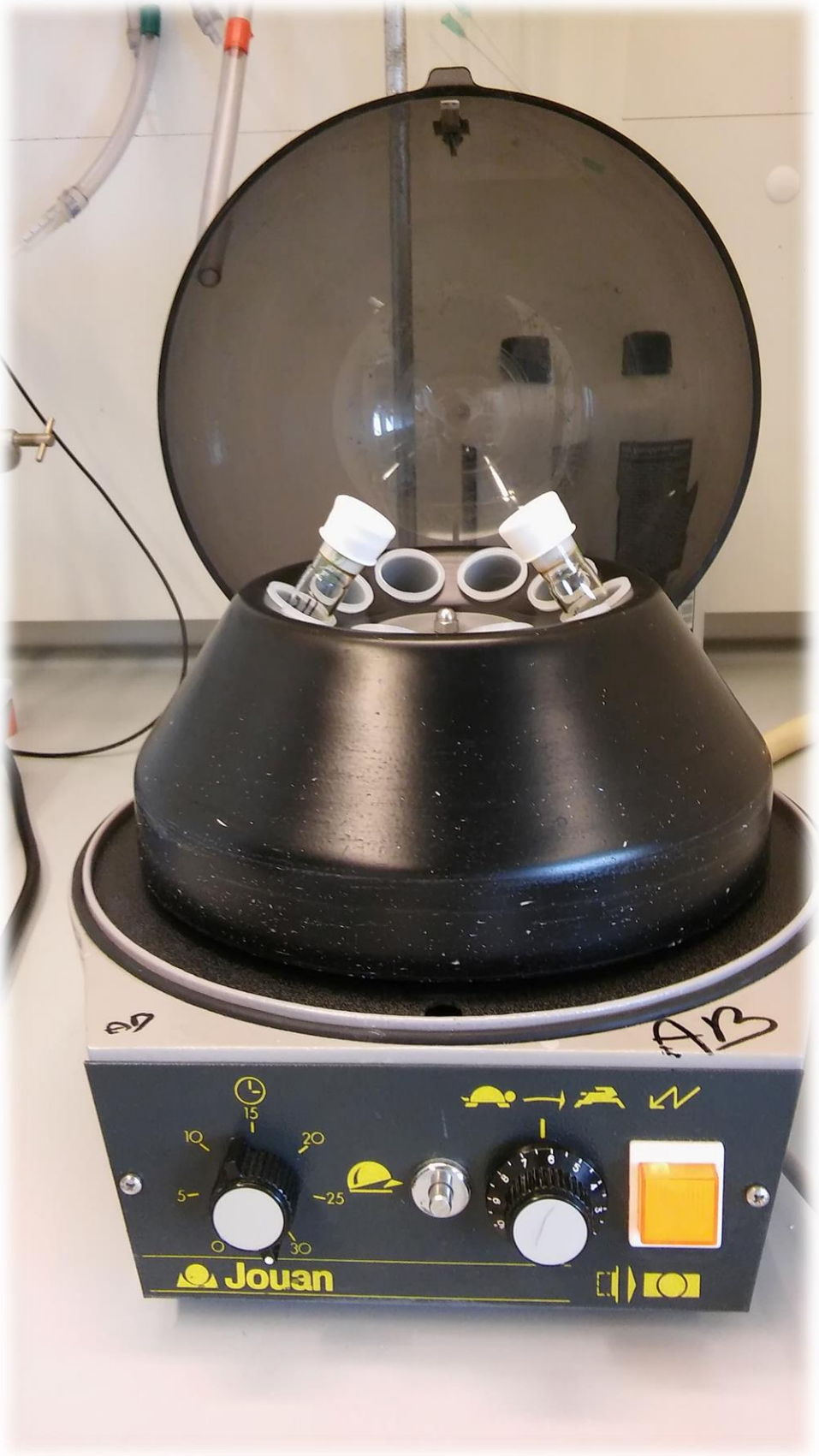


Figure S26. Centrifugation to precipitate inorganic matter.

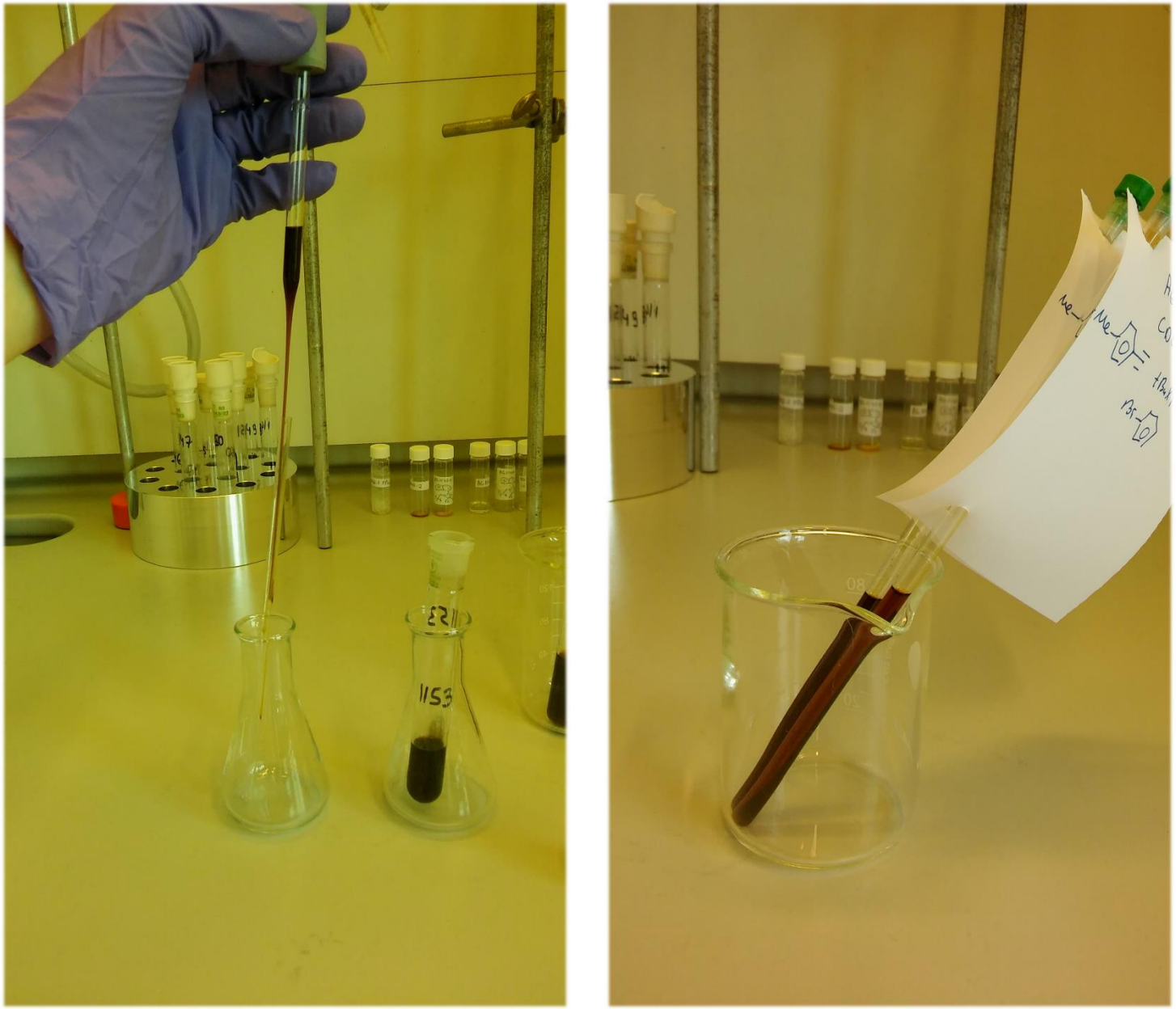


Figure S27. Taking an aliquot for crude ^{1}H NMR analysis.

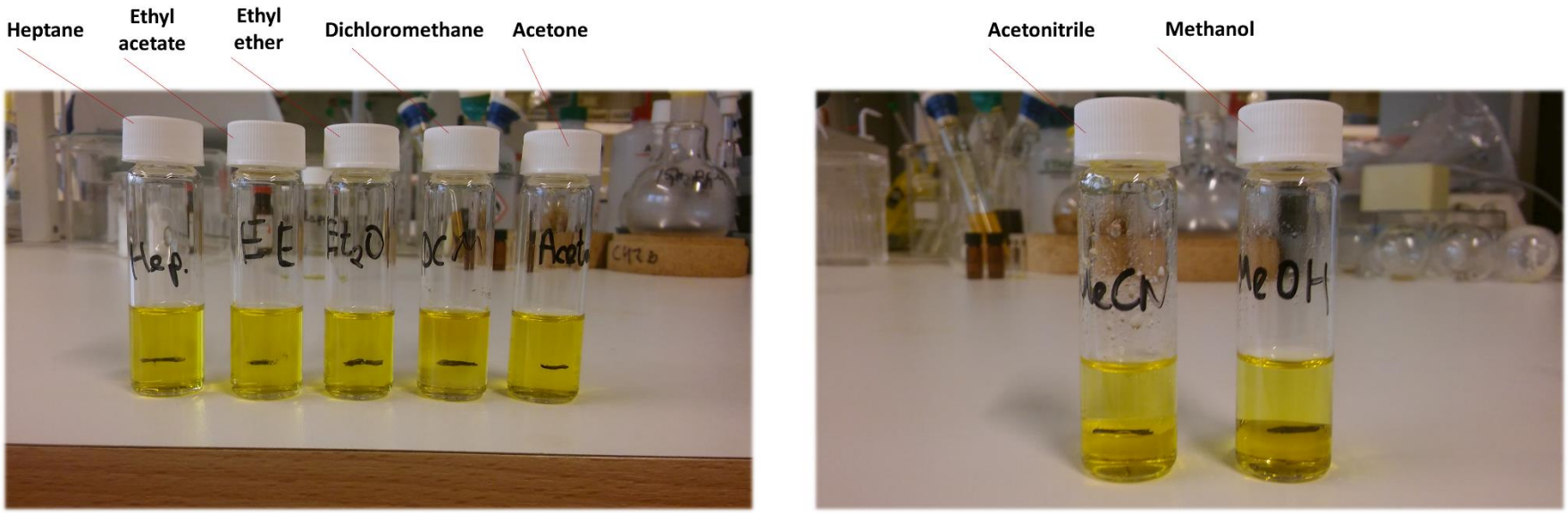
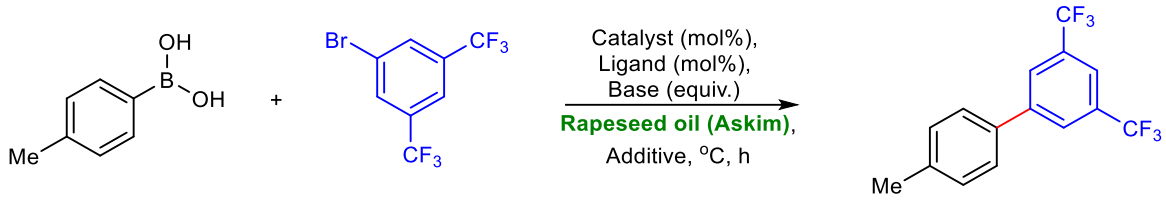


Figure S28. Miscibility of rapeseed oil with common organic solvents.

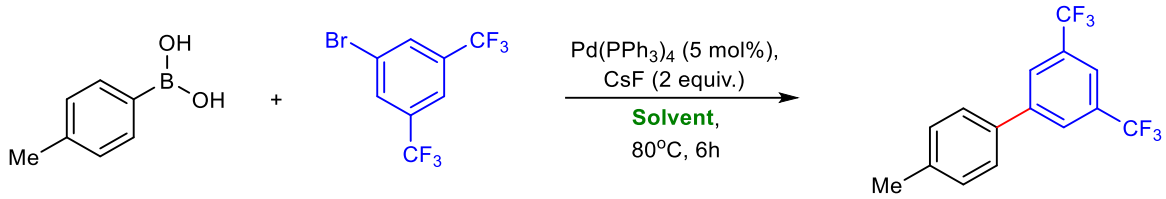
Table S1. Suzuki-Miyaura coupling in rapeseed oil from Askim: optimization



Entry	Catalyst (mol%)	Ligand (mol%)	Base (equiv.)	Additive (mL)	°C, h	Yield %[a]
1	Pd_2dba_3 (2)	XPhos (8)	K_2CO_3 (2)	-	80, 24	60
2	Pd_2dba_3 (2)	*t*BuXPhos (8)	K_2CO_3 (2)	-	80, 24	33
3	Pd_2dba_3 (2)	DavePhos (8)	K_2CO_3 (2)	-	80, 24	82
4	Pd_2dba_3 (2)	DavePhos (8)	CsF (2)	-	80, 24	100
5	Pd_2dba_3 (2)	SPhos (8)	K_2CO_3 (2)	-	80, 24	77
6	Pd_2dba_3 (2)	BrettPhos (8)	K_2CO_3 (2)	-	80, 24	80
7	Pd_2dba_3 (2)	RuPhos (8)	K_2CO_3 (2)	-	80, 24	63
8	XPhos Pd G3 (0.4)	XPhos (0.4)	K_2CO_3 (2)	-	80, 24	63
9	Pd_2dba_3 (2)	XantPhos (4)	K_2CO_3 (2)	-	80, 24	58
10	Pd_2dba_3 (2)	Ad_2BuPHI (8)	K_2CO_3 (2)	-	80, 24	37
11	$Pd(OAc)_2$ (3)	tBu_3PHBF_4 (6)	K_2CO_3 (2)	-	80, 24	57
12	$[PdCl(allyl)]_2$ (2)	IPrHCl (5)	K_2CO_3 (2)	-	80, 24	8
13	Pd_2dba_3 (2)	$AsPh_3$ (8)	K_2CO_3 (2)	-	80, 24	67
14	$Pd(OAc)_2$ (3)	P(2-furyl)$_3$ (12)	K_2CO_3 (2)	-	80, 24	82
15	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	-	80, 24	90
16	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	-	110, 24	89
17	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	-	20, 24	0
18	$Pd(PPh_3)_4$ (2.5)	-	K_2CO_3 (2)	-	80, 24	78
19	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	EtOH (0.3)	80, 24	100
20	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	EtOH (0.3)	20, 24	100
21	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	EtOH (0.3)	80, 6	100
22	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	EtOH (0.1)	80, 6	89
23	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	EtOH (0.3)	20, 6	34
24	$Pd(PPh_3)_4$ (2.5)	-	K_2CO_3 (2)	EtOH (0.3)	20, 24	48
25	$Pd(PPh_3)_4$ (5)	-	K_2CO_3 (2)	Glycerol (0.3)	80, 24	60
26	$Pd(PPh_3)_4$ (5)	-	K_3PO_4 (2)	-	80, 24	67
27	$Pd(PPh_3)_4$ (5)	-	Bu_4NOAc (2)	-	80, 24	0
28	$Pd(PPh_3)_4$ (5)	-	Cs_2CO_3 (2)	-	80, 24	92
29	$Pd(PPh_3)_4$ (5)	-	CsOAc (2)	-	80, 24	83
30	$Pd(PPh_3)_4$ (5)	-	CsF (2)	-	80, 24	100
31	$Pd(PPh_3)_4$ (5)	-	CsF (2)	-	80, 6	100/92[b]

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield.

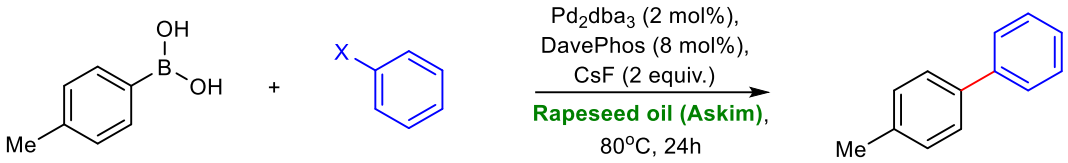
Table S2. Suzuki-Miyaura coupling in oils: screening of solvents



Entry	Solvent (2 mL)	Yield %[a]
1	Triacetin	88
2	Tributyrin	100
3	Rapeseed oil (Askim)	100/92[b]
4	Rapeseed oil (Coop)	87
5	Rapeseed oil (Odelia)	100
6	Rapeseed oil (Rema)	80/100[c]
7	Rapeseed oil (Anglamark)	100
8	Rapeseed oil (Sigma)	97
9	Sunflower oil	95
10	Sunflower oil (Sigma)	78/100[c]
11	Olive oil	100
12	Soybean oil	94
13	Soybean oil (Sigma)	88
14	Corn oil	100
15	Avocado oil	89
16	Sesame oil	100
17	Rice bran oil	95
18	Mixture of oils	98
19	Coconut oil	98
20	Butter	100
21	Fish oil	83/100[c]
22	Fish oil (Sigma)	100
23	Carnauba wax No. 1 yellow	97[d]
24	Beeswax, refined	22
25	Lanolin	96
26	2MeTHF	91
27	Acetal	98
28	Dioxane	100
29	Toluene	100
30	DMF	86

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield. [c] The reaction was performed in the presence of DavePhos/Pd_2dba_3-based catalytic system. [d] The reaction was performed at 90 °C.

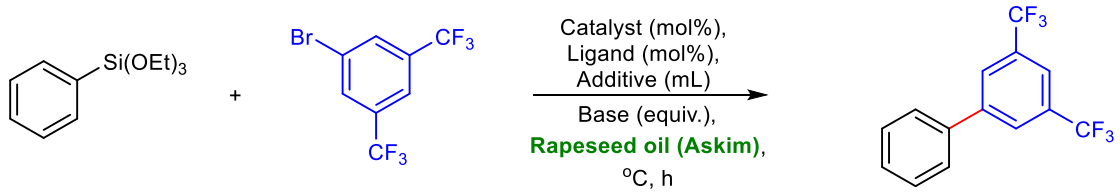
Table S3. Suzuki-Miyaura coupling in rapeseed oil from Askim: screening of electrophiles



Entry	X	Yield %[a]
1	X = Br	100/99[b]
2	X = Cl	59/49[b]
3	X = OTf	100/99[b]
4	X = OTs	0
5	X = OMs	0

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield.

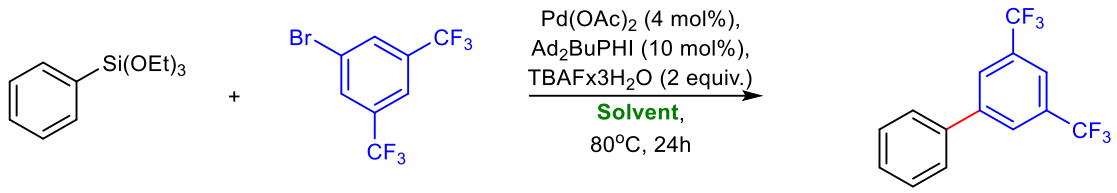
Table S4. Hiyama coupling in rapeseed oil from Askim: optimization



Entry	Catalyst (mol%)	Ligand (mol%)	Base (2 equiv.)	Additive (mL)	°C, h	Yield %[a]
1	Pd_2dba_3 (2)	XPhos (10)	TBAFx3H_2O	-	80, 24	72
2	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	-	80, 24	60
3	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	-	80, 24	58[b]
4	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	MS 4 Å[c]	80, 24	32
5	Pd_2dba_3 (2)	*t*BuXPhos (10)	TBAFx3H_2O	-	80, 24	69
6	Pd_2dba_3 (2)	DavePhos (10)	TBAFx3H_2O	-	80, 24	65
7	Pd_2dba_3 (2)	SPhos (10)	TBAFx3H_2O	-	80, 24	80
8	Pd_2dba_3 (2)	BrettPhos (10)	TBAFx3H_2O	-	80, 24	51
9	Pd_2dba_3 (2)	RuPhos (10)	TBAFx3H_2O	-	80, 24	60
10	*t*BuXPhos Pd G3 (0.4)	*t*BuXPhos (0.4)	TBAFx3H_2O	-	80, 24	20
11	Pd_2dba_3 (2)	XantPhos (5)	TBAFx3H_2O	-	80, 24	44
12	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (10)	TBAFx3H_2O	-	80, 24	57
13	Pd_2dba_3 (2)	*t*$Bu_2MePHBF_4$ (10)	TBAFx3H_2O	-	80, 24	46
14	Pd_2dba_3 (2)	Ad_2BuPHI (10)	TBAFx3H_2O	-	80, 24	93
15	$Pd(OAc)_2$ (4)	Ad_2BuPHI (10)	TBAFx3H_2O	-	80, 24	96/79[d]
16	$Pd(OAc)_2$ (4)	DABCO (8)	TBAFx3H_2O	-	80, 24	62
17	$Pd(OAc)_2$ (4)	IPrHCl (4)	TBAFx3H_2O	-	80, 24	60
18	$PdCl_2$[P(*o*-Tol)$_3$]$_2$ (4)	-	TBAFx3H_2O	-	80, 24	36
19	$Pd(OAc)_2$ (4)	Ad_2BuPHI (10)	TBAFx3H_2O	-	110, 24	60
20	$Pd(OAc)_2$ (2)	Ad_2BuPHI (5)	TBAFx3H_2O	-	80, 24	89
21	$Pd(OAc)_2$ (4)	Ad_2BuPHI (10)	TBAFx3H_2O	EtOH (0.2)	80, 24	97
22	$Pd(OAc)_2$ (4)	Ad_2BuPHI (10)	TBAFx3H_2O	EtOH (0.2)	20, 24	0
23	$Pd(OAc)_2$ (4)	Ad_2BuPHI (10)	TBAFx3H_2O	EtOH (0.2)	80, 6	90
24	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	EtOH (0.2)	80, 24	99/90[d]
25	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	EtOH (0.1)	80, 24	89
26	$Pd(OAc)_2$ (4)	XPhos (10)	TBAFx3H_2O	Glycerol (0.2)	80, 24	20
27	$Pd(OAc)_2$ (4)	XPhos (10)	CsF	-	80, 24	0
28	$Pd(OAc)_2$ (4)	XPhos (10)	CsF/TBAB (0.5)	-	80, 24	9

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Silane used in 2 equiv.. [c] 80 mg. [d] Isolated yield.

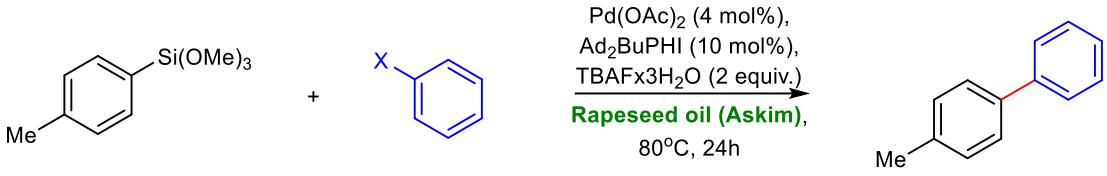
Table S5. Hiyama coupling in oils: screening of solvents



Entry	Solvent (2 mL)	Yield %[a]
1	Triacetin	93
2	Tributyrin	96
3	Rapeseed oil (Askim)	96/79[b]
4	Rapeseed oil (Coop)	86
5	Rapeseed oil (Odelia)	93
6	Rapeseed oil (Rema)	86
7	Rapeseed oil (Anglamark)	92
8	Rapeseed oil (Sigma)	86
9	Sunflower oil	86
10	Sunflower oil (Sigma)	72/88[c]
11	Olive oil	84
12	Soybean oil	93
13	Soybean oil (Sigma)	82
14	Corn oil	93
15	Avocado oil	91
16	Sesame oil	74/92[c]
17	Rice bran oil	79
18	Mixture of oils	85
19	Coconut oil	78
20	Butter	88
21	Fish oil	88
22	Fish oil (Sigma)	92
23	Carnauba wax No. 1 yellow	100[d]
24	Beeswax, refined	86
25	Lanolin	79
26	2MeTHF	98
27	Acetal	85
28	Dioxane	88
29	Toluene	91
30	DMF	67

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield. [c] The reaction was performed in the presence of ethanol (0.2 mL). [d] The reaction was performed at 90 °C.

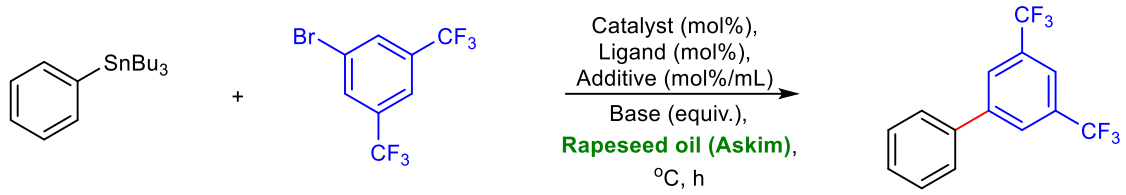
Table S6. Hiyama coupling in rapeseed oil from Askim: screening of electrophiles



Entry	X	Yield %[a]
1	X = Br	98
2	X = Cl	24
3	X = OTf	51
4	X = OTs	0
5	X = OMs	0

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard.

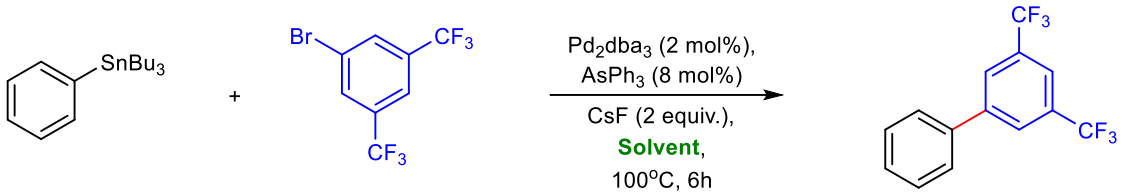
Table S7. Stille coupling in rapeseed oil from Askim: optimization



Entry	Catalyst (mol%)	Ligand (mol%)	Base (2 equiv.)	Additive	°C, h	Yield %[a]
1	Pd_2dba_3 (2)	XPhos (8)	KF	-	100, 24	98
2	Pd_2dba_3 (2)	XPhos (8)	TBAFx3H_2O	-	100, 24	89
3	Pd_2dba_3 (2)	XPhos (8)	CsF	-	100, 24	99
4	Pd_2dba_3 (2)	XPhos (8)	K_2CO_3	-	100, 24	95
5	Pd_2dba_3 (2)	XPhos (8)	Cs_2CO_3	-	100, 24	84
6	$Pd(OAc)_2$ (2)	XPhos (3)	CsF	-	100, 24	93
7	$Pd(OAc)_2$ (2)	XPhos (3)	CsF	EtOH (0.3 mL)	100, 24	97
8	Pd_2dba_3 (2)	*t*BuXPhos (8)	CsF	-	100, 24	4
9	Pd_2dba_3 (2)	DavePhos (8)	CsF	-	100, 24	100
10	Pd_2dba_3 (2)	SPhos (8)	CsF	-	100, 24	91
11	Pd_2dba_3 (2)	BrettPhos (8)	CsF	-	100, 24	95
12	Pd_2dba_3 (2)	RuPhos (8)	CsF	-	100, 24	95
13	Pd_2dba_3 (2)	XantPhos (5)	CsF	-	100, 24	100
14	Pd_2dba_3 (1.5)	Ad_2BuPHI (8)	CsF	-	100, 24	90
15	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	CsF	-	100, 24	37
16	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	CsF	CuI (4 mol%)	100, 24	1
17	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	CsF	CuI (4 mol%)/EtOH (0.3 mL)	100, 24	68
18	$Pd(OAc)_2$ (2)	IPrHCl (3)	CsF	-	100, 24	98
19	Pd_2dba_3 (2)	P(2-furyl)$_3$ (8)	CsF	-	100, 24	98
20	Pd_2dba_3 (2)	$AsPh_3$ (8)	CsF	-	100, 24	99
21	Pd_2dba_3 (2)	$AsPh_3$ (8)	CsF	-	20, 24	16
22	Pd_2dba_3 (2)	$AsPh_3$ (8)	CsF	-	100, 6	100/99[b]
23	Pd_2dba_3 (0.5)	$AsPh_3$ (2)	CsF	-	100, 6	92

[a] Yields determined by ^{1}H NMR using 1,2,4,5-tetramethylbenzene as internal standard. [b] Isolated yield.

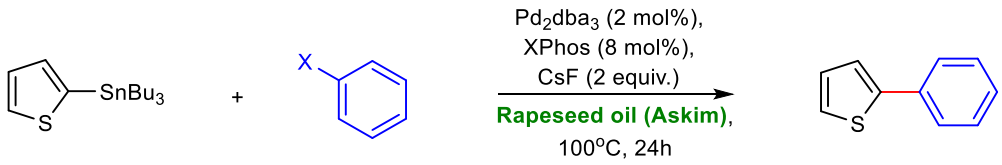
Table S8. Stille coupling in oils: screening of solvents



Entry	Solvent (2 mL)	Yield %[a]
1	Triacetin	95
2	Tributyrin	96
3	Rapeseed oil (Askim)	100/99[b]
4	Rapeseed oil (Coop)	100
5	Rapeseed oil (Odelia)	98
6	Rapeseed oil (Rema)	95
7	Rapeseed oil (Anglamark)	97
8	Rapeseed oil (Sigma)	94
9	Sunflower oil	100
10	Sunflower oil (Sigma)	100
11	Olive oil	95
12	Soybean oil	98
13	Soybean oil (Sigma)	98
14	Corn oil	100
15	Avocado oil	94
16	Sesame oil	96
17	Rice bran oil	100
18	Mixture of oils	97
19	Coconut oil	98
20	Butter	95
21	Fish oil	98
22	Fish oil (Sigma)	97
23	Carnauba wax No. 1 yellow	100
24	Beeswax, refined	94
25	Lanolin	100
26	2MeTHF	100
27	Acetal	100
28	Dioxane	100
29	Toluene	100
30	DMF	75

[a] Yields determined by ^{1}H NMR using 1,2,4,5-tetramethylbenzene as internal standard. [b] Isolated yield.

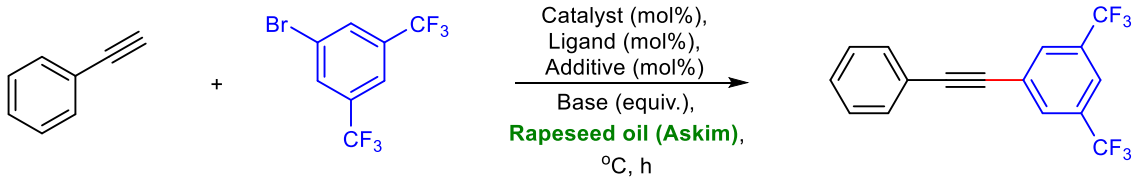
Table S9. Stille coupling in rapeseed oil from Askim: screening of electrophiles



Entry	X	Yield %[a]
1	X = Br	92
2	X = Cl	100/88[b]
3	X = OTf	74/71[b]
4	X = OTs	47
5	X = OMs	45

[a] Yields determined by ^{1}H NMR using 1,2,4,5-tetramethylbenzene as internal standard. [b] Isolated yields.

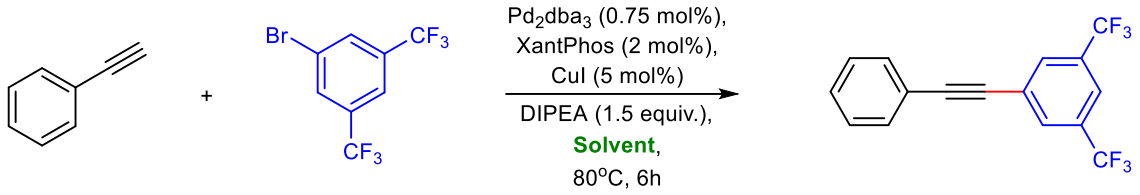
Table S10. Sonogashira coupling in rapeseed oil from Askim: optimization



Entry	Catalyst (mol%)	Ligand (mol%)	Additive (mol%)	Base (equiv.)	°C, h	Yield %[a]
1	Pd_2dba_3 (1.5)	XPhos (6)	CuI (5)	DIPEA (1.5)	80, 24	57
2	Pd_2dba_3 (1.5)	*t*BuXPhos (6)	CuI (5)	DIPEA (1.5)	80, 24	73
3	Pd_2dba_3 (1.5)	DavePhos (6)	CuI (5)	DIPEA (1.5)	80, 24	27
4	Pd_2dba_3 (1.5)	SPhos (6)	CuI (5)	DIPEA (1.5)	80, 24	8
5	Pd_2dba_3 (1.5)	BrettPhos (6)	CuI (5)	DIPEA (1.5)	80, 24	73
6	Pd_2dba_3 (1.5)	RuPhos (6)	CuI (5)	DIPEA (1.5)	80, 24	11
7	Pd_2dba_3 (1.5)	tBu_3PHBF_4 (6)	CuI (5)	DIPEA (1.5)	80, 24	21
8	Pd_2dba_3 (1.5)	Ad_2BuP (6)	CuI (5)	DIPEA (1.5)	80, 24	23
9	Pd_2dba_3 (1.5)	XantPhos (4)	CuI (5)	DIPEA (1.5)	80, 24	100
10	Pd_2dba_3 (0.75)	XantPhos (2)	CuI (5)	DIPEA (1.5)	80, 6	100/86[b]
11	Pd_2dba_3 (1.5)	XantPhos (4)	CuI (5)	DIPEA (1.5)	20, 24	100
12	$PdCl_2(PPh_3)_2$ (3)	-	CuI (5)	DIPEA (1.5)	80, 24	99/96[b]
13	$PdCl_2(PPh_3)_2$ (3)	-	CuI (5)	DIPEA (1.5)	20, 24	98
14	$PdCl_2(PPh_3)_2$ (3)	-	CuI (5)	DIPEA (1.5)	20, 6	36
15	$PdCl_2(PPh_3)_2$ (3)	-	CuI (5)	DIPEA (1.5)	80, 6	98
16	$PdCl_2(PPh_3)_2$ (1.5)	-	CuI (5)	DIPEA (1.5)	20, 24	89
17	$PdCl_2(PPh_3)_2$ (1.5)	-	CuI (5)	DIPEA (1.5)	80, 6	96
18	$PdCl_2(PPh_3)_2$ (3)	-	-	DIPEA (1.5)	80, 24	91
19	Pd_2dba_3 (1.5)	Ad_2BuP (6)	-	DIPEA (1.5)	80, 24	24
20	Pd_2dba_3 (1.5)	tBu_3PHBF_4 (6)	-	DIPEA (1.5)	80, 24	44
21	Pd_2dba_3 (1.5)	XPhos (6)	-	DIPEA (1.5)	80, 24	63
22	Pd_2dba_3 (1.5)	XantPhos (4)	-	DIPEA (1.5)	80, 24	45

[a] Yields determined by ^1H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield.

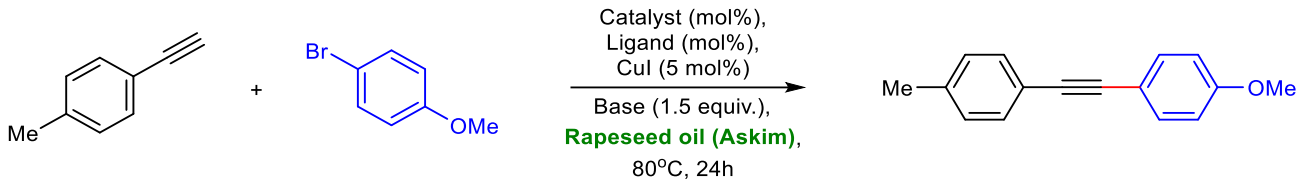
Table S11. Sonogashira coupling in oils: screening of solvents



Entry	Solvent (2 mL)	Yield %[a]
1	Triacetin	100
2	Tributyrin	100
3	Rapeseed oil (Askim)	100/86[b]
4	Rapeseed oil (Coop)	100
5	Rapeseed oil (Odelia)	100
6	Rapeseed oil (Rema)	100
7	Rapeseed oil (Anglamark)	100
8	Rapeseed oil (Sigma)	100
9	Sunflower oil	100
10	Sunflower oil (Sigma)	100
11	Olive oil	100
12	Soybean oil	100
13	Soybean oil (Sigma)	100
14	Corn oil	100
15	Avocado oil	99
16	Sesame oil	100
17	Rice bran oil	100
18	Mixture of oils	100
19	Coconut oil	100
20	Butter	100
21	Fish oil	100
22	Fish oil (Sigma)	100
23	Carnauba wax No. 1 yellow	100[c]
24	Beeswax, refined	99
25	Lanolin	99
26	2MeTHF	100
27	Acetal	97
28	Dioxane	100
29	Toluene	96
30	DMF	95

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard. [b] Isolated yield. [c] The reaction was performed at 90 °C.

Table S12. Sonogashira coupling in oils: optimization for unactivated aryl bromides

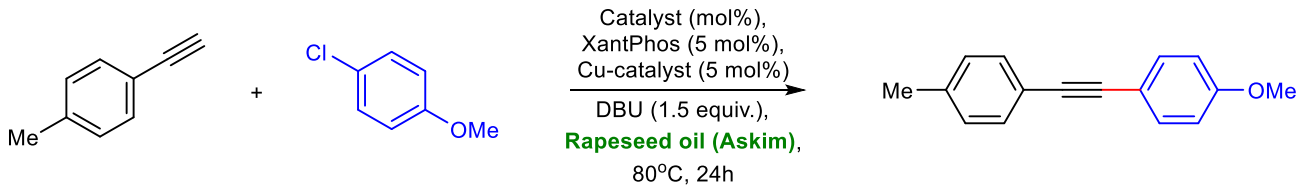


Entry	Catalyst (mol%)	Ligand (mol%)	Base	Yield %[a]
1	Pd_2dba_3 (2)	XantPhos (5)	DIPEA	28
2	Pd_2dba_3 (2)	XantPhos (5)	TEA	59
3	Pd_2dba_3 (2)	XantPhos (5)	Cy_2NMe	67
4	Pd_2dba_3 (2)	XantPhos (5)	Bu_4NOAc	51
5	Pd_2dba_3 (2)	XantPhos (5)	Cs_2CO_3	61
6	Pd_2dba_3 (2)	DPEPhos (5)	Cy_2NMe	29
7	Pd_2dba_3 (2)	*t*Bu-Xantphos (5)	Cy_2NMe	0
8	Pd_2dba_3 (2)	*N*-XantPhos (5)	Cy_2NMe	25
9	Pd_2dba_3 (2)	dppBz (5)	Cy_2NMe	0
10	Pd_2dba_3 (2)	dppf (5)	Cy_2NMe	27
11	Pd_2dba_3 (2)	dippf (5)	Cy_2NMe	21
12	Pd_2dba_3 (2)	1-Diphenylphosphino-1′-(di-*tert*-butylphosphino)ferrocene (5)	Cy_2NMe	18
13	Pd_2dba_3 (2)	dppb (5)	Cy_2NMe	0
14	XantPhos Pd G3 (4)	-	Cy_2NMe	47
15	$PdCl_2$(dtbpf) (4)	-	Cy_2NMe	13
16	Pd_2dba_3 (2)	XPhos (8)	Cy_2NMe	31
17	Pd_2dba_3 (2)	*t*BuXPhos (8)	Cy_2NMe	46
18	Pd_2dba_3 (2)	BrettPhos (8)	Cy_2NMe	36
19	Pd_2dba_3 (2)	Ad_2BuPHI (8)	Cy_2NMe	14
20	Pd_2dba_3 (2)	tBu_3PHBF_4 (8)	Cy_2NMe	0
21	$PdCl_2(PPh_3)_2$ (5)	-	Cy_2NMe	34
22	Pd_2dba_3 (2)	XantPhos (5)	*i*PrN(Me)*t*Bu	53
23	Pd_2dba_3 (2)	XantPhos (5)	2-(Diethylamino)ethanol	58
24	Pd_2dba_3 (2)	XantPhos (5)	Triethanolamine	61
25	Pd_2dba_3 (2)	XantPhos (5)	Hexamethyldisilazane	8
26	Pd_2dba_3 (2)	XantPhos (5)	TMEDA	88
27	Pd_2dba_3 (2)	XantPhos (5)	2,6-Lutidine	0
28	Pd_2dba_3 (2)	XantPhos (5)	DMAP	57
29	Pd_2dba_3 (2)	XantPhos (5)	2,2,6,6-Tetramethylpiperidine	87
30	Pd_2dba_3 (2)	XantPhos (5)	Pempidine	77
31	Pd_2dba_3 (2)	XantPhos (5)	1,1,3,3-Tetramethylguanidine	66
32	Pd_2dba_3 (2)	XantPhos (5)	DBU	100

33	Pd_2dba_3 (2)	XantPhos (5)	TBD	61

[a] Yields determined by ^1H NMR using 1,3,5-trimethoxybenzene as internal standard.

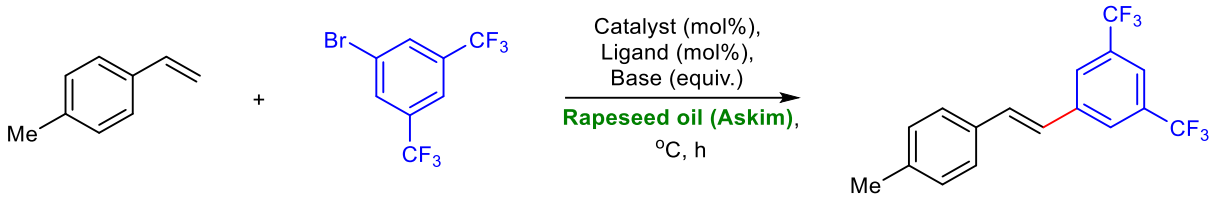
Table S13. Sonogashira coupling in oils: optimization for aryl chlorides



Entry	Catalyst (mol%)	Cu-catalyst (5 mol%)	Yield %[a]
1	Pd_2dba_3 (2)	CuI	12
2	Pd_2dba_3 (2)	Cu(TC)	6
3	Pd_2dba_3 (2)	$[(MeCN)_4Cu]PF_6$	2
4	$PdCl_2$ (4)	CuI	0
5	$Pd(OAc)_2$ (4)	CuI	0
6	$[PdCl(allyl)]_2$ (2)	CuI	0
7	$[(\eta^3$-1-*tert*-Butylindenyl)(μ-Cl)Pd$]_2$ (2)	CuI	0
8	$[$(Cinnamyl)PdCl$]_2$ (2)	CuI	0
9	Di-μ-chlorobis[2-[(dimethylamino)methyl]phenyl-C,N]dipalladium(II) (2)	CuI	0
10	Di-μ-mesylbis[2′-(amino-N)[1,1′-biphenyl]-2-yl-C]dipalladium(II) (2)	CuI	0
11	cataCXium® C (2)	CuI	20

[a] Yields determined by ^{1}H NMR using 1,3,5-trimethoxybenzene as internal standard.

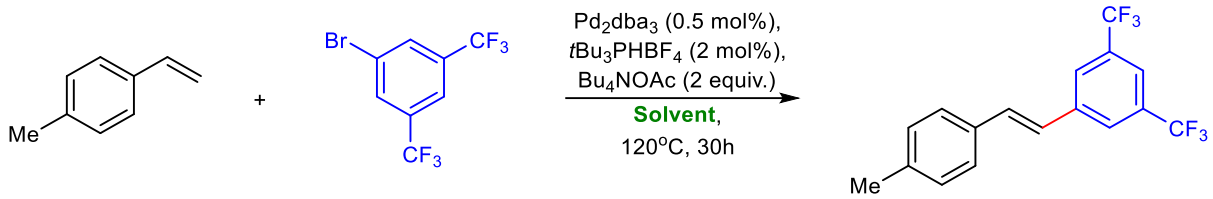
Table S14. Heck coupling in rapeseed oil from Askim: optimization



Entry	Catalyst (mol%)	Ligand (mol%)	Base (2 equiv.)	°C, h	Yield %[a]
1	Pd_2dba_3 (3)	XPhos (12)	TEA	120°C, 48h	12
2	Pd_2dba_3 (3)	*t*BuXPhos (12)	TEA	120°C, 48h	71
3	Pd_2dba_3 (3)	*t*BuXPhos (12)	Bu_4NOAc	120°C, 30h	100
4	Pd_2dba_3 (3)	DavePhos (12)	TEA	120°C, 48h	64
5	Pd_2dba_3 (3)	SPhos (12)	TEA	120°C, 48h	20
6	Pd_2dba_3 (3)	BrettPhos (12)	TEA	120°C, 48h	0
7	Pd_2dba_3 (3)	RuPhos (12)	TEA	120°C, 48h	16
8	Pd_2dba_3 (3)	JohnPhos (12)	TEA	120°C, 48h	56
9	XPhos Pd G3 (1)	XPhos (1)	TEA	120°C, 48h	21
10	*t*BuXPhos Pd G3 (1)	*t*BuXPhos (1)	TEA	120°C, 48h	50
11	Pd_2dba_3 (3)	XantPhos (7)	TEA	120°C, 48h	0
12	Pd_2dba_3 (3)	Ad_2BuPHI (12)	TEA	120°C, 48h	7
13	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	TEA	120°C, 48h	82
14	$[PdCl(allyl)]_2$ (3)	IPrHCl (7)	TEA	120°C, 48h	17
15	$PdCl_2(PPh_3)_2$ (5)	-	TEA	120°C, 48h	13
16	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	TEA	80°C, 48h	8
17	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	TEA	140°C, 30h	83
18	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	TEA	120°C, 24h	82
19	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	TEA	120°C, 30h	82
20	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	Cs_2CO_3	120°C, 30h	14
21	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	DIPEA	120°C, 30h	90
22	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	DIPEA	120°C, 30h	63[b]
23	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	Cy_2NMe	120°C, 30h	93
24	Pd_2dba_3 (3)	*t*Bu_3PHBF_4 (12)	Bu_4NOAc	120°C, 30h	100
25	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	Bu_4NOAc	120°C, 30h	100
26	Pd_2dba_3 (1.5)	*t*Bu_3PHBF_4 (6)	Bu_4NOAc	120°C, 30h	100
27	Pd_2dba_3 (0.5)	*t*Bu_3PHBF_4 (2)	Bu_4NOAc	120°C, 30h	100/94[c]

[a] Yields determined by ^1H NMR using methyl 3,5-dinitrobenzoate as internal standard. [b] 4-Methylstyrene used in 2 equiv.. [c] Isolated yield.

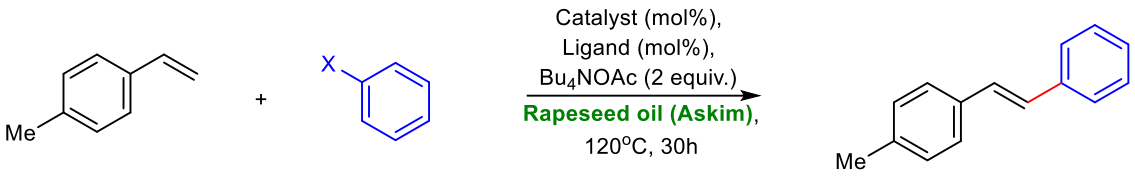
Table S15. Heck coupling in oils: screening of solvents



Entry	Solvent (3 mL)	Yield %[a]
1	Triacetin	68/86[b]
2	Tributyrin	65/82[b]
3	Rapeseed oil (Askim)	100/94[c]
4	Rapeseed oil (Coop)	100
5	Rapeseed oil (Odelia)	100
6	Rapeseed oil (Rema)	100
7	Rapeseed oil (Anglamark)	100
8	Rapeseed oil (Sigma)	100
9	Sunflower oil	100
10	Sunflower oil (Sigma)	98
11	Olive oil	100
12	Soybean oil	100
13	Soybean oil (Sigma)	100
14	Corn oil	100
15	Avocado oil	95
16	Sesame oil	98
17	Rice bran oil	96
18	Mixture of oils	100
19	Coconut oil	85/96[b]
20	Butter	97
21	Fish oil	100
22	Fish oil (Sigma)	92
23	Carnauba wax No. 1 yellow[d]	100
24	Beeswax, refined[d]	85
25	Lanolin	100
26	2MeTHF	35
27	Acetal	76
28	Dioxane	89
29	Toluene	65
30	DMF	87

[a] Yields determined by ^{1}H NMR using methyl 3,5-dinitrobenzoate as internal standard. [b] The catalyst loading was Pd_2dba_3 (3 mol%), *t*Bu_3PHBF_4 (12 mol%). [c] Isolated yield. [d] We have used 2 g of corresponding solvent.

Table S16. Heck coupling in rapeseed oil from Askim: screening of electrophiles

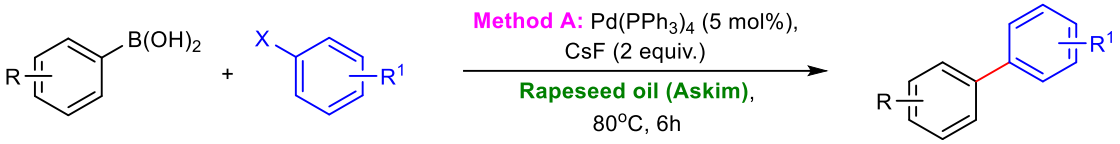


Entry	Catalyst (mol%)	Ligand (mol%)	X	Yield %[a]
1	Pd_2dba_3 (0.5)	*t*Bu_3PHBF_4 (2)	X = Br	67
2	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	X = Br	100/99[b]
3	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	X = Cl	41
4	Pd_2dba_3 (2)	*t*BuXPhos (8)	X = Cl	0
5	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	X = OTf	37
6	Pd_2dba_3 (2)	*t*BuXPhos (8)	X = OTf	0
7	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	X = OTs	0
8	Pd_2dba_3 (2)	*t*Bu_3PHBF_4 (8)	X = OMs	0

[a] Yields determined by ^{1}H NMR using methyl 3,5-dinitrobenzoate as internal standard. [b] Isolated yield.

General experimental procedures for cross-couplings

Suzuki-Miyaura coupling, Method A (Figure S29).



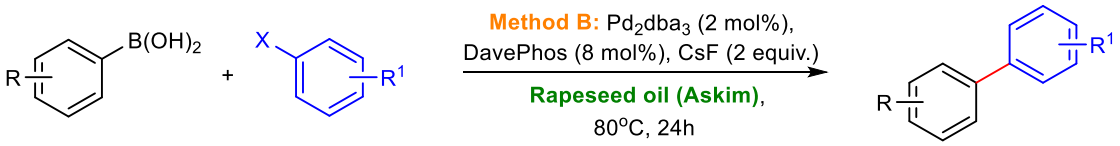
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with appropriate boronic acid (1 equiv., 0.724-0.786 mmol), $Pd(PPh_3)_4$ (5 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim or waste rapeseed oil (3 mL) and corresponding aryl halide[3] (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 6 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Suzuki-Miyaura coupling, Method B (Figure S29).



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with appropriate boronic acid (1 equiv., 1.011-1.103 mmol), Pd_2dba_3 (2 mol%), DavePhos (8 mol%) and CsF (2 equiv.).

[5] DCM can be substituted with 2MeTHF, Et_2O or EtOAc.

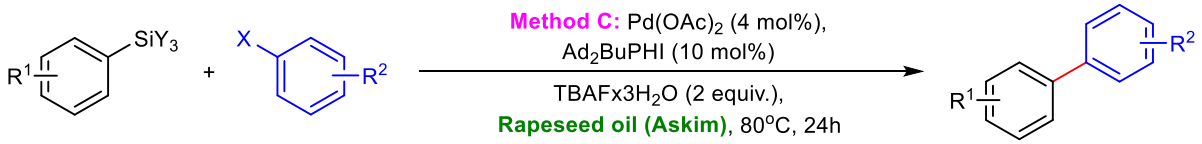
The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL) and corresponding aryl halide/sulfonate ester[3] (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Hiyama coupling, Method C (Figure S29).



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with $Pd(OAc)_2$ (4 mol%), Ad_2BuPHI (10 mol%) and $TBAFx3H_2O$ (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), appropriate alkoxysilane (1 equiv., 0.725-0.848 mmol) and corresponding aryl halide/triflate[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

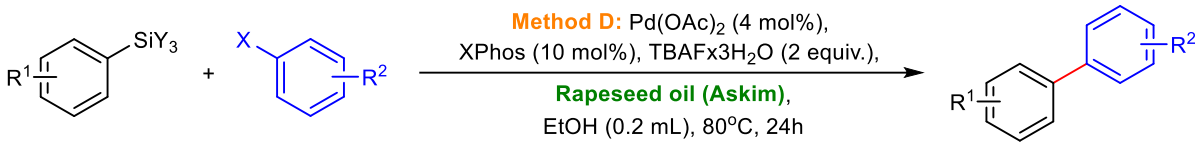
(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate,

dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Hiyama coupling, Method D (Figure S29).



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with $Pd(OAc)_2$ (4 mol%), XPhos (10 mol%) and $TBAFx3H_2O$ (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), absolute ethanol (0.2 mL), appropriate alkoxysilane (1 equiv., 0.725-0.848 mmol) and corresponding aryl halide[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

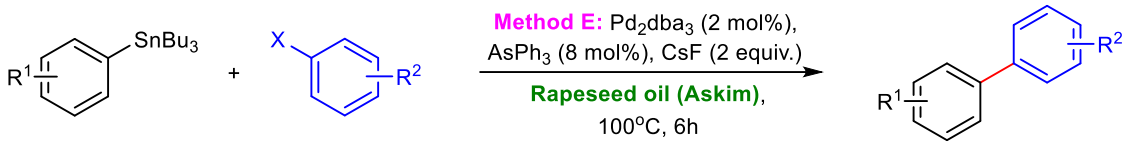
(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture.

Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Stille coupling, Method E (Figure S29).



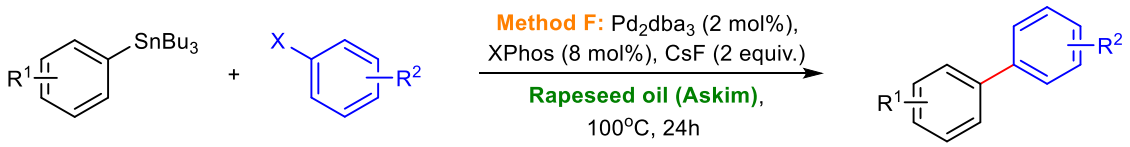
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), $AsPh_3$ (8 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), appropriate organotin reagent (1 equiv., 0.634-0.716 mmol) and corresponding aryl halide[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 100 °C for 6 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Stille coupling, Method F (Figure S29).



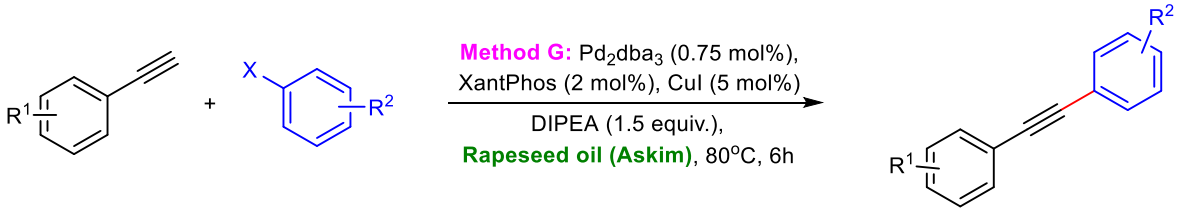
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), XPhos (8 mol%) and CsF (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), appropriate organotin reagent (1 equiv., 0.634-0.716 mmol) and corresponding aryl halide/triflate[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 100 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Sonogashira coupling, Method G (Figure S29).



Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (0.75 mol%), XantPhos (2 mol%), CuI (5 mol%), suitable acetylene (1 equiv., 0.947-0.999 mmol, degassed), corresponding aryl halide (1.5 equiv., degassed), rapeseed oil from Askim (3 mL, degassed) and DIPEA (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed from the glove box and stirred at 60-80 °C for 6-24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

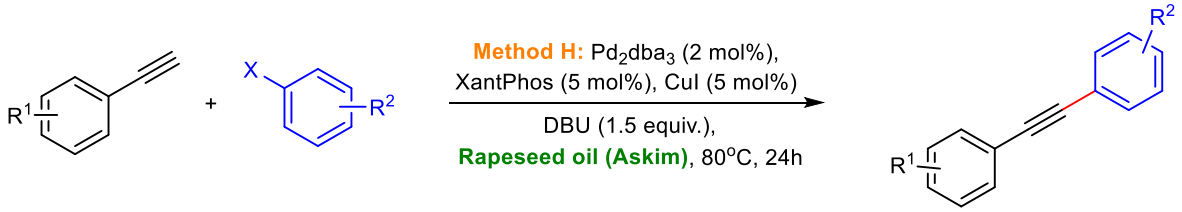
(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation

using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 250 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Sonogashira coupling, Method H (Figure S29).



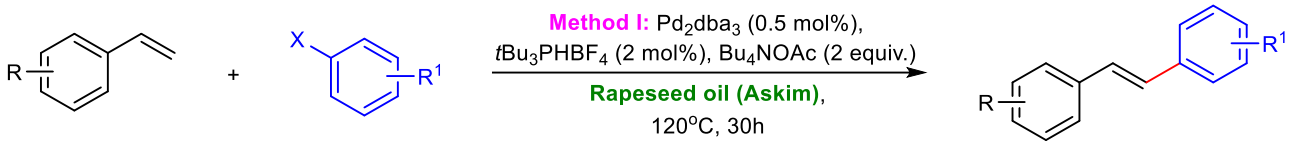
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), XantPhos (5 mol%), CuI (5 mol%), suitable acetylene (1 equiv., 0.979 mmol, degassed), corresponding aryl halide/sulfonate ester (1.5 equiv., degassed), rapeseed oil from Askim (3 mL, degassed) and DBU (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed from the glove box and stirred at 80 °C for 24 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 250 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Heck coupling, Method I (Figure S29).



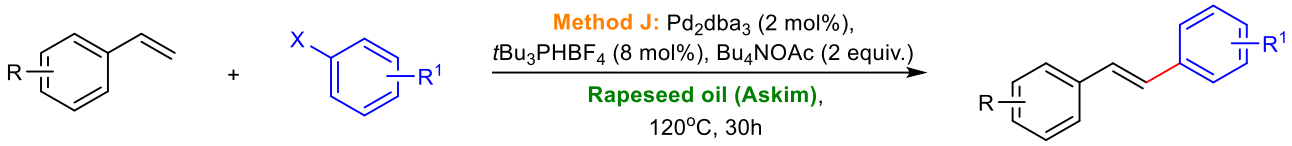
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (0.5 mol%), *t*Bu_3PHBF_4 (2 mol%) and Bu_4NOAc (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), appropriate olefin (1 equiv., 0.819-0.894 mmol) and corresponding aryl halide[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 °C for 30 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 250 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask. The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Heck coupling, Method J (Figure S29).



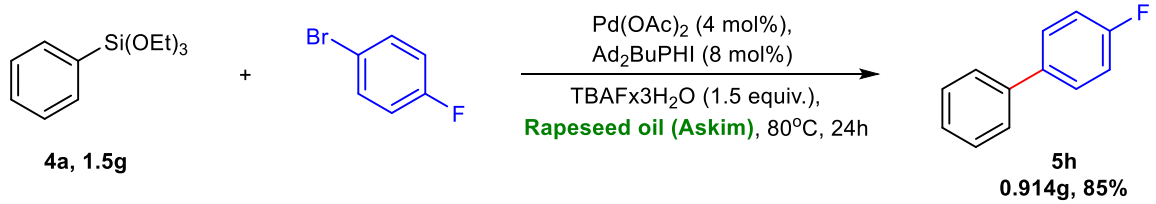
Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), tBu$_3$PHBF$_4$ (8 mol%) and Bu$_4$NOAc (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), appropriate olefin (1 equiv., 0.819-0.894 mmol) and corresponding aryl halide[3] (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 °C for 30 h. Afterwards, the reaction mixture was cooled down, which was followed by isolation of the product according to one of the following methods:

(I) The reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent. Rapeseed oil can be washed out from the column using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(II) The flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 250 °C under reduced pressure. The product is being condensed in the receiving bulb within 40-60 minutes. If necessary, the condensed product can be further purified by column chromatography. Rapeseed oil from the flask containing the reaction mixture can be filtered through a short pad of silica gel using ethyl acetate, dried and applied for another experiment. NMR spectra of rapeseed oil before and after the reaction are identical.

(III) The reaction mixture was transferred into a 250 mL round bottom flask.[6] The reaction vial was washed using EtOAc or THF and transferred into the 250 mL flask containing the reaction mixture. Afterwards, volatiles were removed using rotary evaporator that was followed by addition of 40 mL of 5M NaOH solution. The flask was equipped with a condenser and stirred under reflux for 4 h. The resulting mixture was treated with 100 mL of saturated NaCl solution, transferred into a 500 mL separating funnel and extracted with DCM (3 x 50 mL).[5] Organic factions were collected, evaporated to dryness and further purified using a column chromatography.

Gram-scale Hiyama coupling.



4a, 1.5g

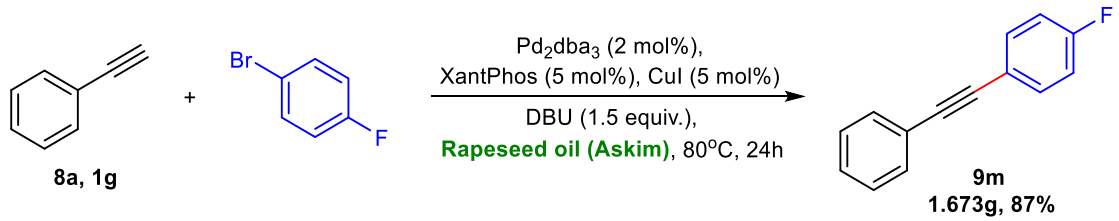
5h
0.914g, 85%

Inside of an Ar filled glove box an oven dried 50 mL round bottom flask was sequentially charged with $Pd(OAc)_2$ (4 mol%), Ad_2BuPHI (8 mol%) and TBAFx3H$_2$O (1.5 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were

[6] This method of separation is not applicable for the product **11h**.

added rapeseed oil from Askim (15 mL), triethoxyphenylsilane (1 equiv., 6.240 mmol) and 1-bromo-4-fluorobenzene (1.5 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 80 °C for 24 h. Afterwards, the flask containing the reaction mixture was attached to the short-path vacuum distillation apparatus (Kugelrohr) and heated to 200 °C under reduced pressure. The product is being condensed in the receiving bulb within 60 minutes. The condensed product was further purified by column chromatography.

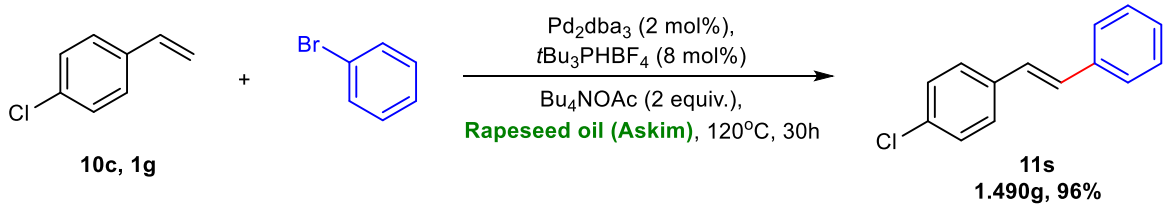
Gram-scale Sonogashira coupling.



8a, 1g **9m**
1.673g, 87%

Inside of an Ar filled glove box an oven dried 50 mL round bottom flask was sequentially charged with Pd_2dba_3 (2 mol%), XantPhos (5 mol%), CuI (5 mol%), phenylacetylene (1 equiv., 9.790 mmol, degassed), 1-bromo-4-fluorobenzene (1.5 equiv., degassed), rapeseed oil from Askim (20 mL, degassed) and DBU (1.5 equiv., degassed). The flask was sealed with a rubber septa, removed from the glove box and stirred at 80 °C for 24 h. Afterwards, the reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 5 mL of DCM that was diluted with 5 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent.

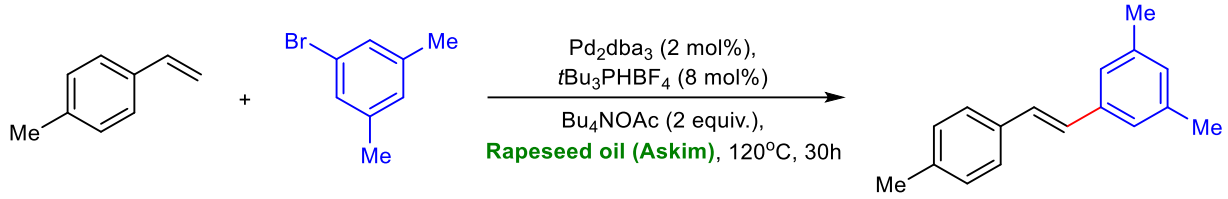
Gram-scale Heck coupling.



10c, 1g **11s**
1.490g, 96%

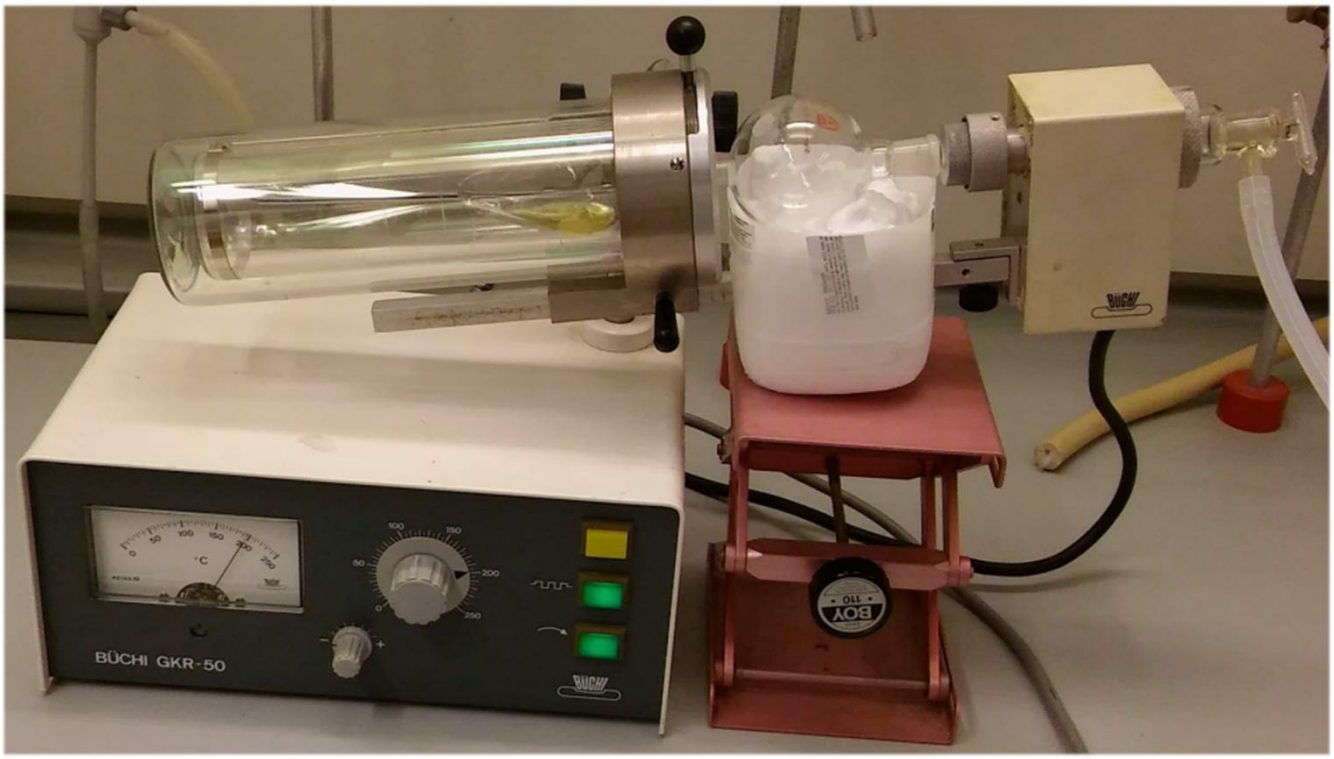
Inside of an Ar filled glove box an oven dried 50 mL round bottom flask was sequentially charged with Pd_2dba_3 (2 mol%), *t*Bu_3PHBF_4 (8 mol%) and Bu_4NOAc (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (20 mL), 4-chlorostyrene (1 equiv., 7.216 mmol) and bromobenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 °C for 30 h. Afterwards, the reaction mixture was transferred onto the top of a column, filled with silica gel, using a disposable Pasteur pipette. The reaction vial was washed with 5 mL of DCM that was diluted with 5 mL of heptane and transferred onto the top of the column. This was followed by a classical column separation using mixtures of heptane as eluent.

Substitution of heptane with other renewable solvents for column chromatography on the instance of Heck cross-coupling.

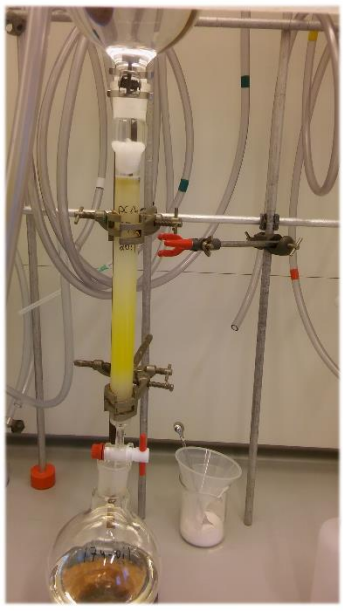


Inside of an Ar filled glove box an oven dried 10 mL flask was sequentially charged with Pd_2dba_3 (2 mol%), *t*Bu_3PHBF_4 (8 mol%) and Bu_4NOAc (2 equiv.). The flask was sealed with a rubber septa, removed from the glove box and equipped with an Ar balloon. Next, sequentially were added rapeseed oil from Askim (3 mL), 4-methylstyrene (1 equiv., 0.846 mmol) and 1-bromo-3,5-dimethylbenzene (2 equiv.). The Ar balloon was removed and the resulting mixture was stirred at 120 ^oC for 30 h. Afterwards, the reaction mixture was transferred onto the top of a column, filled with silica gel (suspended in suitable monoterpene), using a disposable Pasteur pipette. The reaction vial was washed with 1 mL of DCM that was diluted with 1 mL of appropriate monoterpene and transferred onto the top of the column. This was followed by a classical column separation using mixtures of corresponding monoterpene as eluent.

(A) Separation using a Kugelrohr



(B) Separation with column chromatography



(C) Separation based on hydrolysis and extraction

Figure S29. Overview of separation methods.

Production and processing of waste rapeseed oil

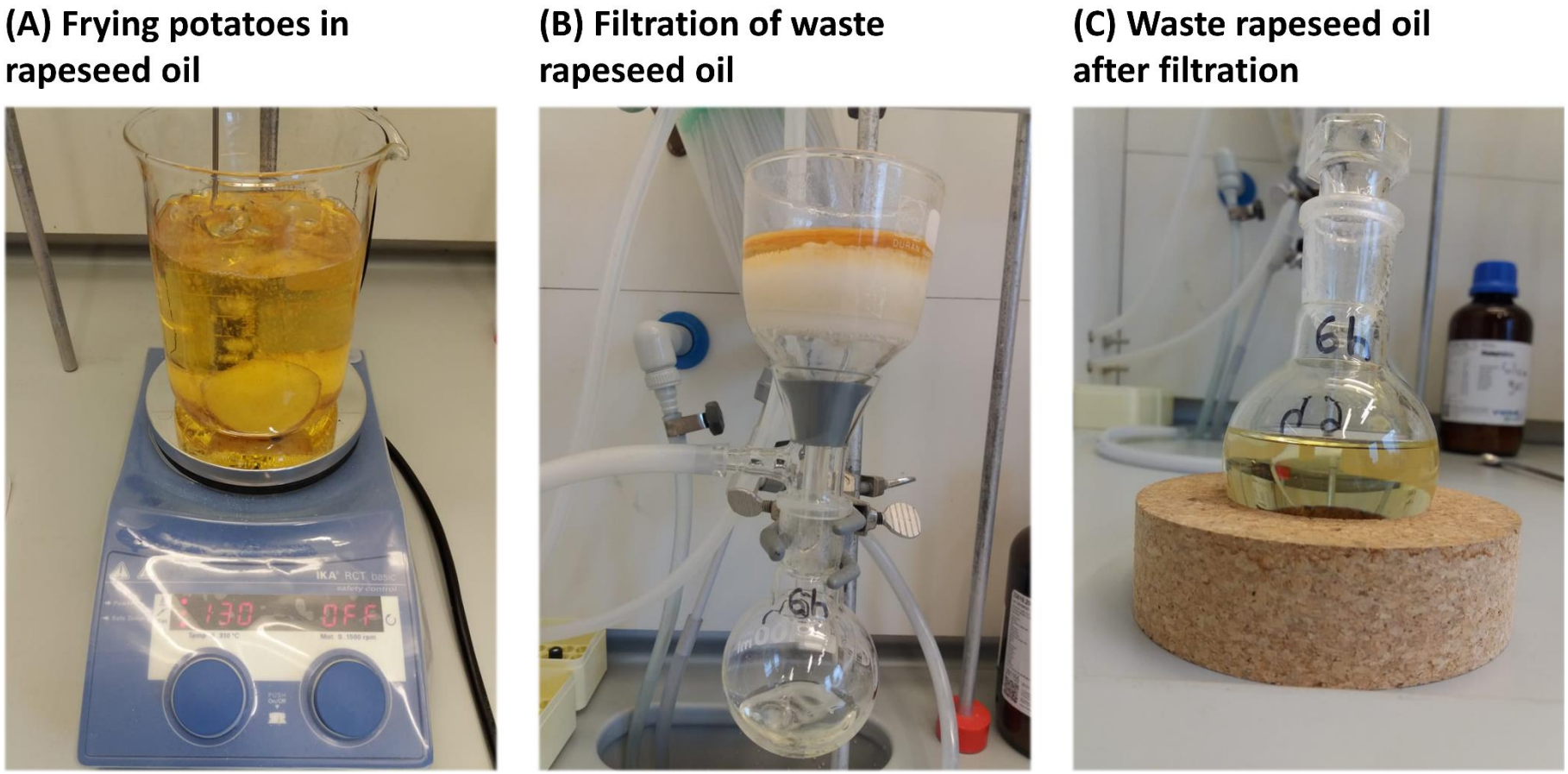


Figure S30. Production and processing of waste rapeseed oil.

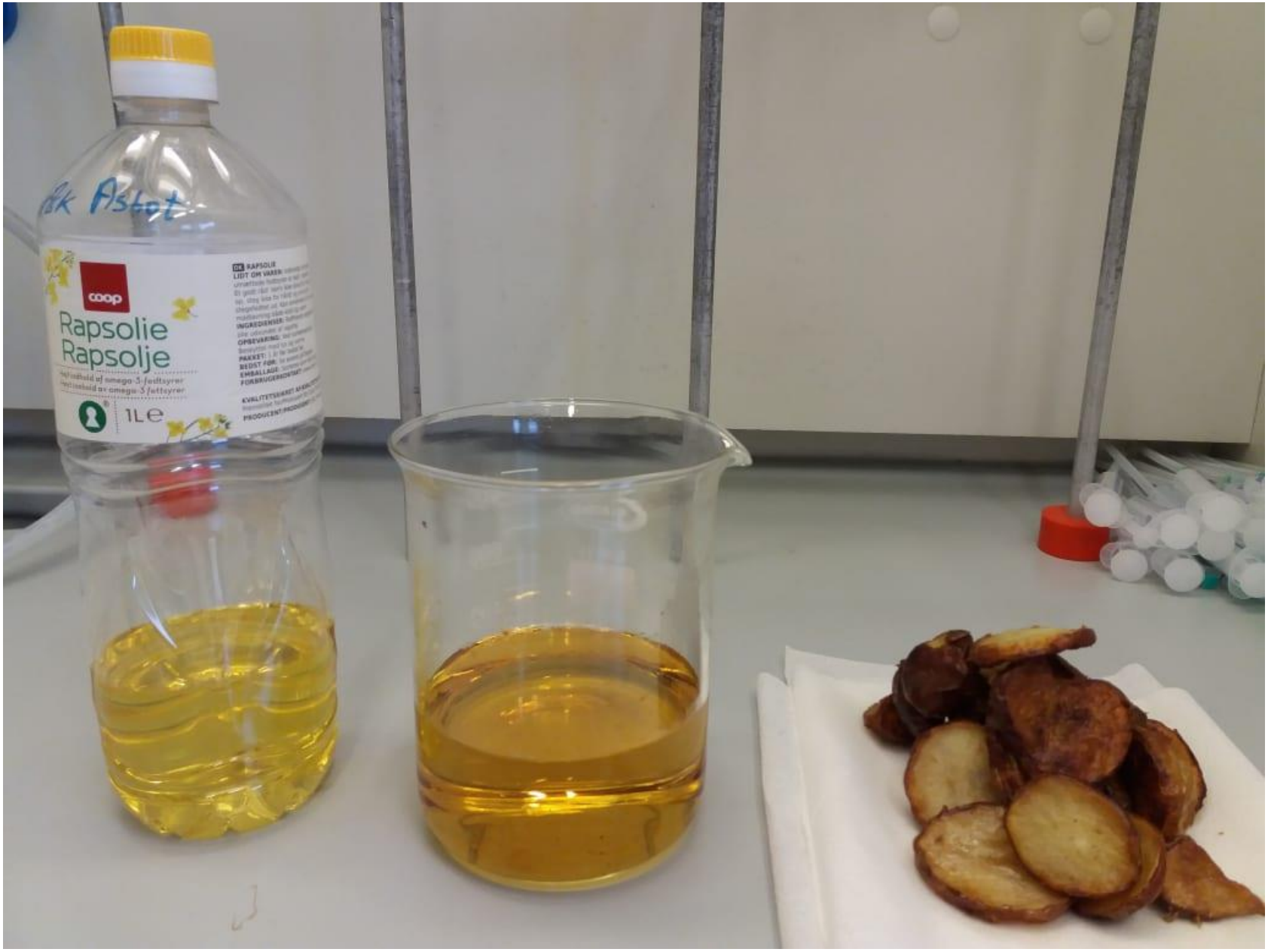


Figure S31. Rapeseed oil from Coop before and after frying potatoes at 130 ºC for 8h.

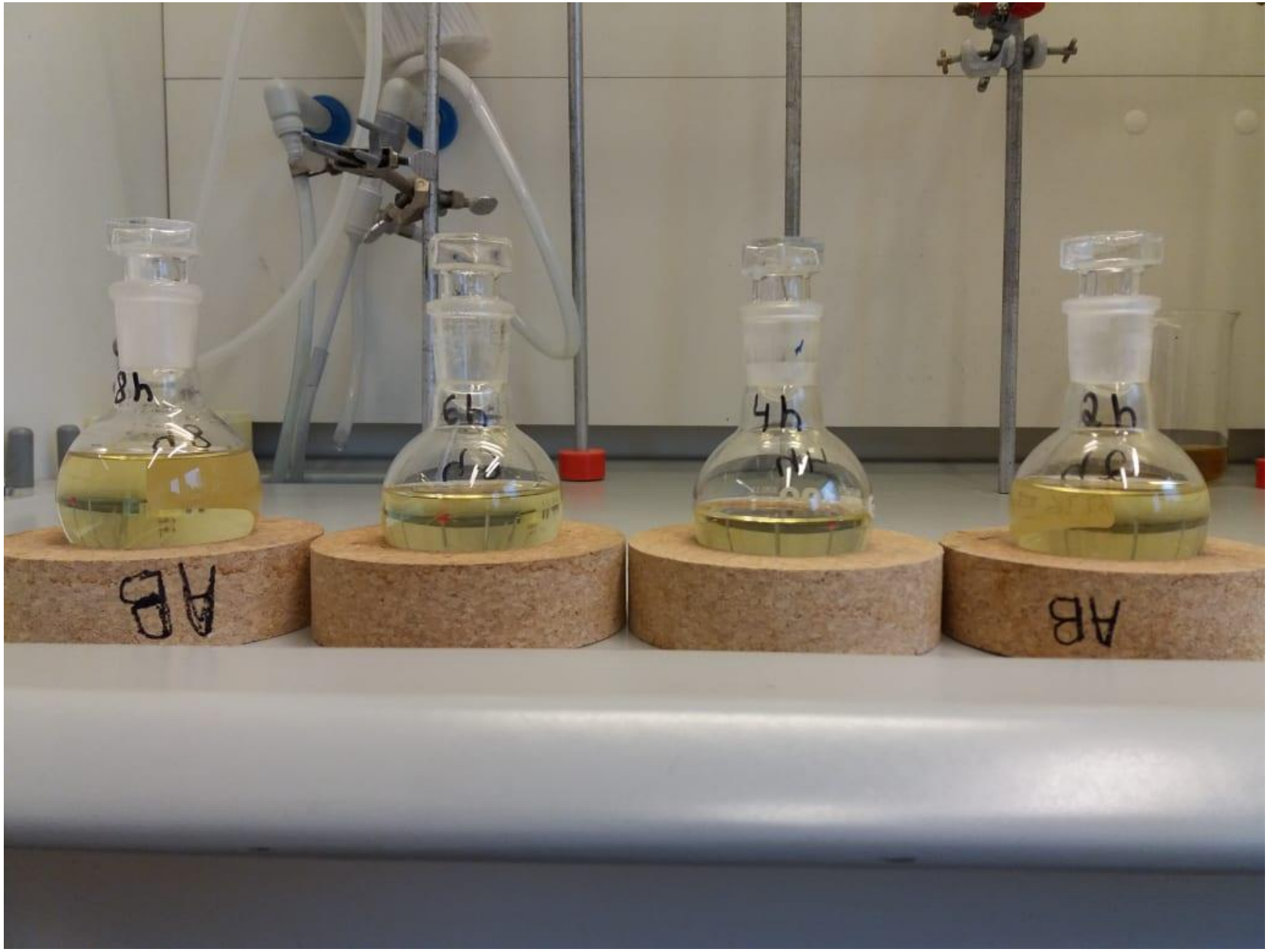
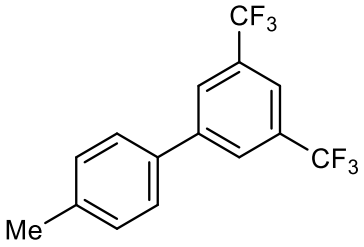
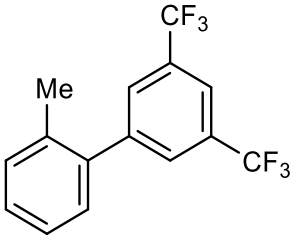


Figure S32. Waste rapeseed oils used for frying potatoes for 2, 4, 6 and 8 hours respectively.

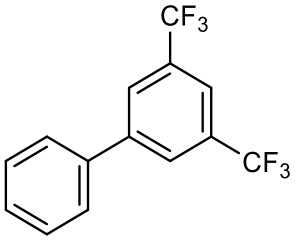
Characterization of products



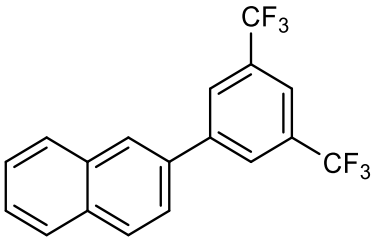
***4'-Methyl-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 3a.**[7] Starting from 0.736 mmol of corresponding boronic acid the product was obtained as a white solid, yield 92% (0.205 g, method A). For the reaction performed in waste rapeseed oil, used for frying at 130 °C for 8h, starting from 0.736 mmol of corresponding boronic acid the product was obtained as a white solid, yield 93% (0.207 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.46 (s, 3H, Me), 7.34 (d, *J* = 7.9 Hz, 2H, Ar), 7.53-7.55 (m, 2H, Ar), 7.88 (s, 1H, Ar), 8.03 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.3, 120.8 (p, *J* = 3.9 Hz), 123.7 (q, *J* = 271 Hz), 127.0-127.1 (m), 127.2, 130.2, 132.3 (q, *J* = 33.2 Hz), 135.5, 139.2, 143.5.



***2-Methyl-3',5'-bis(trifluoromethyl)-1,1'-biphenyl*, 3b.**[8] Starting from 0.736 mmol of corresponding boronic acid the product was obtained as a colourless oil, yield 91% (0.203 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.31 (s, 3H, Me), 7.25-7.27 (m, 1H, Ar), 7.31-7.40 (m, 3H, Ar), 7.84 (s, 2H, Ar), 7.92 (s, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 20.4, 121.0 (hept, *J* = 3.9 Hz), 123.6 (q, *J* = 272.6 Hz), 126.5, 128.9, 129.6 (q, *J* = 3.8 Hz), 129.8, 131.0, 131.8 (q, *J* = 33.2 Hz), 135.4, 139.1, 144.2.

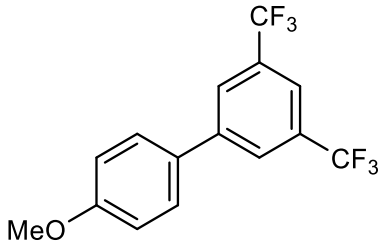


***3,5-Bis(trifluoromethyl)-1,1'-biphenyl*, 3c.**[9] Starting from 0.738 mmol of corresponding boronic acid the product was obtained as a white solid, yield 61% (0.131 g, method A). Starting from 1.066 mmol of corresponding boronic acid the product was obtained as a white solid, 94% (0.291 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.44-7.49 (m, 1H, Ar), 7.50-7.54 (m, 2H, Ar), 7.60-7.63 (m, 2H, Ar), 7.88 (s, 1H, Ar), 8.03 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.1 (p, *J* = 3.8 Hz), 123.6 (q, *J* = 271 Hz), 127.4, 129.1, 129.5, 132.3 (q, *J* = 33.2 Hz), 138.4, 143.5.

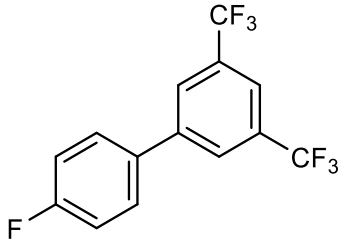


***2-(3,5-Bis(trifluoromethyl)phenyl)naphthalene*, 3d.**[10] Starting from 0.756 mmol of corresponding boronic acid the product was obtained as a white solid, yield 97% (0.249 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.59 (td, *J* = 5.7, 4.8, 3.3 Hz, 2H, Ar), 7.71 (dd, *J* = 8.5, 1.9 Hz, 1H, Ar), 7.90-7.98 (m, 4H, Ar), 8.05 (s, 1H, Ar), 8.17 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.1 (hept, *J* = 3.9 Hz), 123.7 (q, *J* = 271 Hz), 124.8, 126.7, 127.0, 127.1, 127.5 (q, *J* = 3.5 Hz), 127.9, 128.6, 129.3, 132.4 (q, *J* = 33.2 Hz), 133.4, 133.7, 135.5, 143.4.

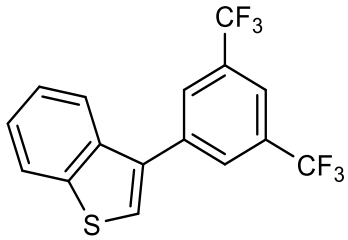
[7] F. D'Accriscio, A. Ohleier, E. Nicolas, M. Demange, O. T. D. Boullay, N. Saffon-Merceron, M. Fustier-Boutignon, E. Rezabal, G. Frison, N. Nebra and N. Mezailles, *Organometallics*, 2020, **39**, 1688-1699.
[8] Y. Uozumi and Y. Nakai, *Org. Lett.*, 2002, **4**, 2997-3000.
[9] S. Ichii, G. Hamasaka and Y. Uozumi, *Chem. Asian J.*, 2019, **14**, 3850-3854.
[10] Y.-N. Wang, X.-Q. Guo, X.-H. Zhu, R. Zhong, L.-H. Cai and X.-F. Hou, *Chem. Commun.*, 2012, **48**, 10437-10439.



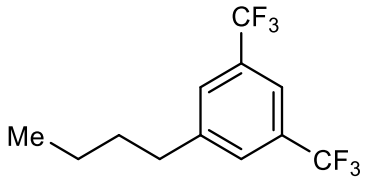
***4'-Methoxy-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 3e.**[11] Starting from 0.724 mmol of corresponding boronic acid the product was obtained as a white solid, yield 95% (0.219 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.88 (s, 3H, OMe), 7.02-7.05 (m, 2H, Ar), 7.54-7.58 (m, 2H, Ar), 7.82 (s, 1H, Ar), 7.98 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.6, 114.9, 120.4 (p, *J* = 3.8 Hz), 123.7 (q, *J* = 271 Hz), 126.8 (q, *J* = 3.8 Hz), 128.6, 130.8, 132.2 (q, *J* = 33.1 Hz), 143.1, 160.6.



***4'-Fluoro-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 3f.**[12] Starting from 0.786 mmol of corresponding boronic acid the product was obtained as a white solid, yield 42% (0.102 g, method A). Starting from 1.072 mmol of corresponding boronic acid the product was obtained as a white solid, 94% (0.311 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.18-7.23 (m, 2H, Ar), 7.57-7.62 (m, 2H, Ar), 7.88 (s, 1H, Ar), 7.98 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 116.5 (d, *J* = 21.8 Hz), 121.2 (hept, *J* = 3.9 Hz), 123.6 (q, *J* = 271 Hz), 127.3 (q, *J* = 3.8 Hz), 129.2 (d, *J* = 8.4 Hz), 132.5 (q, *J* = 33.3 Hz), 134.6 (d, *J* = 3.3 Hz), 142.5, 163.6 (d, *J* = 249.2 Hz).

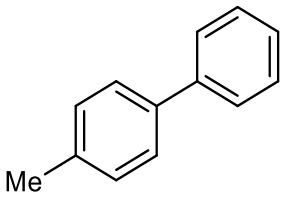


***3-(3,5-Bis(trifluoromethyl)phenyl)benzo[b]thiophene*, 3g.**[13] Starting from 1.011 mmol of corresponding boronic acid the product was obtained as a white solid, yield 99% (0.345 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.45-7.52 (m, 2H, Ar), 7.55 (s, 1H, Ar), 7.83-7.87 (m, 1H, Ar), 7.96-8.00 (m, 2H, Ar), 8.09 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.5 (p, *J* = 3.8 Hz), 122.2, 123.4, 123.6 (q, *J* = 271 Hz), 125.2, 125.3, 125.9, 128.9 (q, *J* = 3.6 Hz), 132.4 (q, *J* = 33.4 Hz), 135.1, 137.2, 138.3, 141.0.

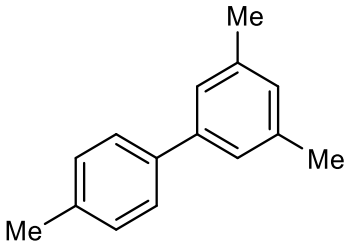


***1-Butyl-3,5-bis(trifluoromethyl)benzene*, 3h.**[14] Starting from 1.079 mmol of corresponding boronic acid the product was obtained as a colourless oil, yield 18% (0.052 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 0.96 (t, *J* = 7.3 Hz, 3H, Me), 1.39 (dq, *J* = 14.7, 7.3 Hz, 2H, CH_2), 1.61-1.69 (m, 2H, CH_2), 2.72-2.76 (m, 2H, CH_2), 7.63 (s, 2H, Ar), 7.70 (s, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 14.0, 22.5, 33.4, 35.6, 120.0 (hept, *J* = 4.0 Hz), 123.7 (q, *J* = 270 Hz), 128.7 (dd, *J* = 5.6, 2.7 Hz), 131.7 (q, *J* = 33.0 Hz), 145.4.

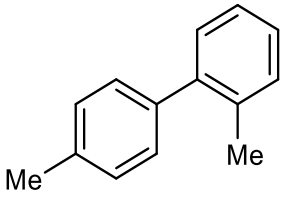
[11] A. D. Zotto, F. Amoroso, W. Baratta and P. Rigo, *Eur. J. Org. Chem.*, 2009, 110-116.
[12] M. Butters, J. N. Harvey, J. Jover, A. J. J. Lennox, G. C. Lloyd-Jones and P. M. Murray, *Angew. Chem. Int. Ed.*, 2010, **49**, 5156-5160.
[13] C. Colletto, J. Bures and I. Larrosa, *Chem. Commun.*, 2017, **53**, 12890-12893.
[14] T. Agrawal and S. P. Cook, *Org. Lett.*, 2013, **15**, 96-99.



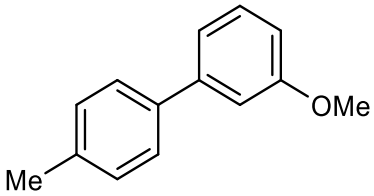
***4-Methyl-1,1'-biphenyl*, 3i.**[15] Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a white solid, yield 99% (0.184 g, X = Br, method B), 49% (0.091 g, X = Cl, method B), 99% (0.185 g, X = OTf, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.53 (s, 3H, Me), 7.38 (d, *J* = 7.9 Hz, 2H, Ar), 7.44-7.48 (m, 1H, Ar), 7.54-7.58 (m, 2H, Ar), 7.63-7.65 (m, 2H, Ar), 7.71-7.74 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.2, 127.1, 127.2, 128.9, 129.6, 137.1, 138.5, 141.3.



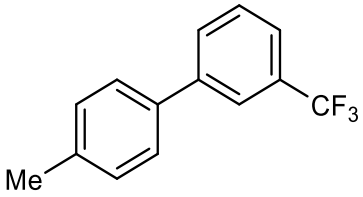
***3,4',5-Trimethyl-1,1'-biphenyl*, 3j.**[16] Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a white solid, yield 99% (0.216 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.47-2.48 (m, 9H, 3xMe), 7.07 (s, 1H, Ar), 7.30-7.33 (m, 4H, Ar), 7.56-7.59 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.3, 21.6, 125.1, 127.2, 128.8, 129.5, 136.9, 138.3, 138.7, 141.4.



***2,4'-Dimethyl-1,1'-biphenyl*, 3k.**[17] Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a colourless oil, yield 99% (0.201 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.43-2.45 (m, 3H, Me), 2.55-2.56 (m, 3H, Me), 7.37-7.42 (m, 8H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 20.7, 21.3, 125.9, 127.2, 128.9, 129.2, 130.0, 130.4, 135.5, 136.5, 139.2, 142.1.



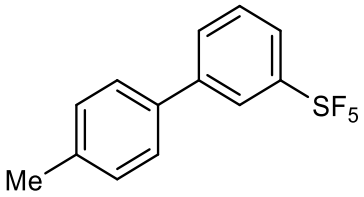
***3-Methoxy-4'-methyl-1,1'-biphenyl*, 3l.**[18] Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a white solid, yield 98% (0.215 g, X = Br, method B), 80% (0.175 g, X = Cl, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.48-2.49 (m, 3H, Me), 3.93-3.94 (m, 3H, OMe), 6.95-6.99 (m, 1H, Ar), 7.21-7.24 (m, 1H, Ar), 7.25-7.28 (m, 1H, Ar), 7.32-7.35 (m, 2H, Ar), 7.40-7.45 (m, 1H, Ar), 7.57-7.61 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.2, 55.4, 112.5, 112.9, 119.6, 127.2, 129.6, 129.8, 137.3, 138.4, 142.8, 160.1.



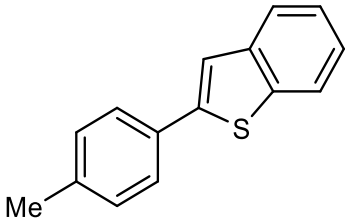
***4'-Methyl-3-(trifluoromethyl)-1,1'-biphenyl*, 3m.**[19] Starting from 0.736 mmol of corresponding boronic acid the product was obtained as a white solid, yield 80% (0.139 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.48 (s, 3H, Me), 7.34 (d, *J* = 7.8 Hz, 2H, Ar), 7.55-7.60 (m, 3H, Ar), 7.64-7.66 (m, 1H, Ar), 7.80 (d, *J* = 7.7 Hz, 1H, Ar), 7.91 (s, 1H, Ar). **^{13}C**

[15] M. M. Heravi, S. Asadi, S. M. H. Chopani and E. Jaderi, *Appl. Organomet. Chem.*, 2020, **34**, 5805.
[16] B. R. Barnett, L. A. Labios, J. M. Stauber, C. E. Moore, A. L. Rheingold and J. S. Figueroa, *Organometallics*, 2017, **36**, 944-954.
[17] K. L. Wilson, J. Murray, C. Jamieson and A. J. B. Watson, *Synlett*, 2018, **29**, 650-654.
[18] X. Zhou, X. Guo, F. Jian and G. Wei, *ACS Omega*, 2018, **3**, 4418-4422.
[19] A. F. Asachenko, K. R. Sorochkina, P. B. Dzhevakov, M. A. Topchiy and M. S. Nechaev, *Adv. Synth. Catal.*, 2013, **355**, 3553-3557.

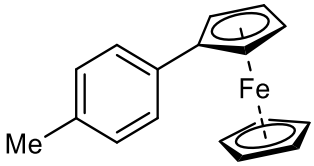
NMR (101 MHz, $CDCl_3$): δ = 21.1, 123.7 (dq, *J* = 7.6, 3.8 Hz), 124.4 (q, *J* = 271 Hz), 127.1, 129.2, 129.8, 130.2-130.3 (m), 131.2 (q, *J* = 32.1 Hz), 136.9, 138.0, 142.0.



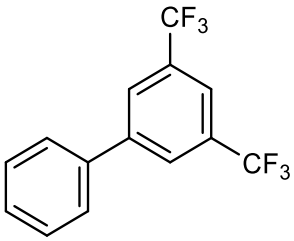
***Pentafluoro(4'-methyl-[1,1'-biphenyl]-3-yl)-λ⁶-sulfane*, 3n.** Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a white solid, yield 99% (0.324 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.48 (s, 3H, Me), 7.33-7.35 (m, 2H, Ar), 7.52-7.56 (m, 3H, Ar), 7.73-7.78 (m, 2H, Ar), 8.03 (p, *J* = 2.0 Hz, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.2, 124.6 (dp, *J* = 20.5, 4.6 Hz), 127.2, 129.2, 130.0, 130.2, 136.7, 138.4, 142.5, 154.7 (p, *J* = 16.8 Hz). **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{13}H_{12}F_5S$ 295.0574 found 295.0570.



***2-(p-Tolyl)benzo[b]thiophene*, 3o.**[20] Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a white solid, yield 62% (0.154 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.41 (s, 3H, Me), 7.24-7.27 (m, 2H, Ar), 7.30-7.39 (m, 2H, Ar), 7.50-7.53 (m, 1H, Ar), 7.62-7.65 (m, 2H, Ar), 7.76-7.79 (m, 1H, Ar), 7.83-7.85 (m, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 119.0, 122.4, 123.6, 124.3, 124.6, 126.5, 129.8, 131.7, 138.4, 139.5, 141.0, 144.6.

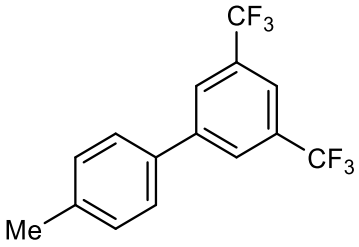


***(4-Methylphenyl)ferrocene*, 3p.** Starting from 1.103 mmol of corresponding boronic acid the product was obtained as a dark red solid, yield 51% (0.154 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.40 (s, 3H, Me), 4.11 (s, 5H, ferrocene), 4.35 (t, *J* = 1.9 Hz, 2H, ferrocene), 4.68 (t, *J* = 1.9 Hz, 2H, ferrocene), 7.17 (d, *J* = 7.8 Hz, 2H, Ar), 7.45 (d, *J* = 7.9 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.3, 66.5, 68.8, 69.7, 85.9, 126.2, 129.2, 135.6, 136.2. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{17}H_{17}Fe$ 277.0674 found 277.0674.

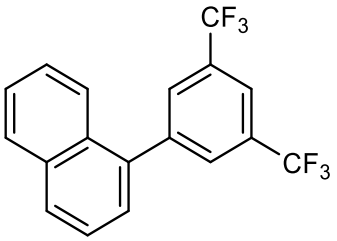


***3,5-Bis(trifluoromethyl)-1,1'-biphenyl*, 5a.**[21] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless solid, yield 79% (0.190 g, method A), 90% (0.218 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.46-7.55 (m, 3H, Ar), 7.62-7.64 (m, 2H, Ar), 7.90 (s, 1H, Ar), 8.05 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.1 (hept, *J* = 3.9 Hz), 123.6 (q, *J* = 271 Hz), 127.4, 129.1, 129.5, 132.4 (q, *J* = 33.2 Hz), 138.5, 143.6.

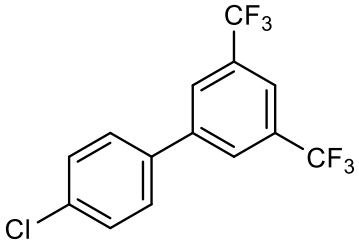
[20] A. E. Purta, S. Ichiia, A. Tazawa and Y. Uozumi, *Synlett*, 2020, **31**, 1634-1638.
[21] S. Ichii, G. Hamasaka and Y. Uozumi, *Chem. Asian J.*, 2019, **14**, 3850-3854.



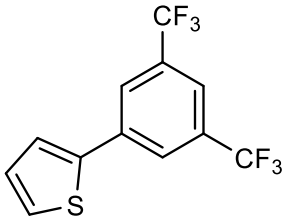
***4'-Methyl-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 5b.**[22] Starting from 0.848 mmol of corresponding silane the product was obtained as a colourless solid, yield 82% (0.211 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.47 (s, 3H, Me), 7.34-7.36 (m, 2H, Ar), 7.52-7.55 (m, 2H, Ar), 7.89 (s, 1H, Ar), 8.04 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.3, 120.8 (hept, *J* = 3.9 Hz), 123.7 (q, *J* = 271 Hz), 127.1-127.2 (m), 127.2, 130.2, 132.3 (q, *J* = 33.2 Hz), 135.5, 139.2, 143.5.



***1-(3,5-Bis(trifluoromethyl)phenyl)naphthalene*, 5c.**[23] Starting from 0.725 mmol of corresponding silane the product was obtained as a colourless solid, yield 75% (0.185 g, method A), 78% (0.192 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.44-7.46 (m, 1H, Ar), 7.49-7.60 (m, 3H, Ar), 7.72-7.76 (m, 1H, Ar), 7.96-8.06 (m, 5H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 119.5, 121.4 (p, *J* = 3.8 Hz), 122.3, 125.0, 125.5, 126.0, 126.5, 127.2, 127.6, 127.7, 128.1, 128.9, 129.3, 130.4 (d, *J* = 3.9 Hz), 131.2, 132.0 (q, *J* = 33.2, 32.7 Hz), 134.0, 137.1, 143.1.

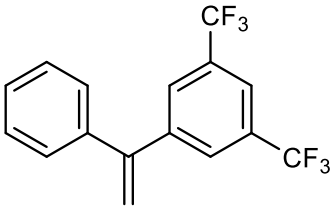


***4'-Chloro-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 5d.**[24] Starting from 0.728 mmol of corresponding silane the product was obtained as a colourless solid, yield 95% (0.224 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.46-7.50 (m, 2H, Ar), 7.53-7.57 (m, 2H, Ar), 7.89 (s, 1H, Ar), 7.99 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.4 (hept, *J* = 3.8 Hz), 123.5 (q, *J* = 271 Hz), 127.2 (q, *J* = 3.9 Hz), 128.7, 129.7, 132.5 (q, *J* = 33.3 Hz), 135.5, 136.8, 142.3.

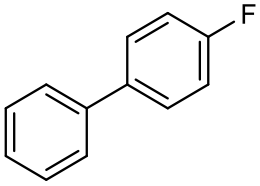


***2-(3,5-Bis(trifluoromethyl)phenyl)thiophene*, 5e.**[25] Starting from 0.812 mmol of corresponding silane the product was obtained as a colourless solid, yield 18% (0.043 g, method A), 60% (0.143 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.14-7.16 (m, 1H, thiophene), 7.41-7.45 (m, 2H, thiophene), 7.78 (s, 1H, Ar), 8.00 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 120.9 (dt, *J* = 7.7, 3.9 Hz), 123.4 (q, *J* = 271 Hz), 125.5, 125.8-125.9 (m), 127.2, 128.8, 132.5 (q, *J* = 33.4 Hz), 136.7, 140.6, 141.1.

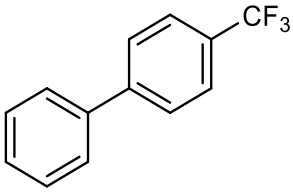
[22] F. D'Accriscio, A. Ohleier, E. Nicolas, M. Demange, O. T. D. Boullay, N. Saffon-Merceron, M. Fustier-Boutignon, E. Rezabal, G. Frison, N. Nebra and N. Mezailles, *Organometallics*, 2020, **39**, 1688-1699.
[23] Z. Zhou, H. Liang, W. Xia, H. Chen, Y. Zhang, X. He, S. Yu, R. Cao and L. Qiu, *New J. Chem.*, 2018, **42**, 5967-5971.
[24] Y. Uozumi and Y. Nakai, *Org. Lett.*, 2002, **4**, 2997-3000.
[25] J. Yang, S. Liu, J.-F. Zheng and J. Zhou, *Eur. J. Org. Chem.*, 2012, 6248-6259.



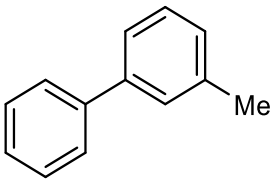
***1-(1-Phenylvinyl)-3,5-bis(trifluoromethyl)benzene*, 5f.**[26] Starting from 0.751 mmol of corresponding silane the product was obtained as a colourless oil, yield 31% (0.073 g, method A), 73% (0.173 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 5.58 (s, 1H, olefin), 5.67 (s, 1H, olefin), 7.29-7.35 (m, 2H, Ar), 7.38-7.43 (m, 3H, Ar), 7.80 (s, 2H, Ar), 7.86 (s, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 117.3, 121.7 (dt, *J* = 7.7, 3.9 Hz), 123.5 (q, *J* = 271 Hz), 128.2, 128.5 (q, *J* = 4.0 Hz), 128.8, 128.9, 131.9 (q, *J* = 33.3 Hz), 139.9, 143.9, 148.0.



***4-Fluoro-1,1'-biphenyl*, 5h.**[27] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless oil, yield 87% (0.125 g, X = Br, method A), 57% (0.081 g, X = Cl, method A). For gram-scale experiment starting from 6.240 mmol (1.5 g) of corresponding silane the product was obtained as a colourless oil, yield 85% (0.914 g). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.14-7.19 (m, 2H, Ar), 7.36-7.42 (m, 1H, Ar), 7.46-7.51 (m, 2H, Ar), 7.56-7.61 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 115.8 (d, *J* = 21.4 Hz), 127.2, 127.4, 128.9 (d, *J* = 8.1 Hz), 129.0, 137.5 (d, *J* = 3.3 Hz), 140.4, 162.6 (d, *J* = 246.3 Hz).

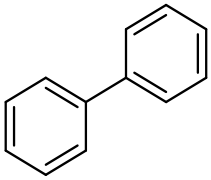


***4-(Trifluoromethyl)-1,1'-biphenyl*, 5i.**[28] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless oil, yield 81% (0.150 g, X = Br, method A), 87% (0.161 g, X = Cl, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.45-7.49 (m, 1H, Ar), 7.51-7.56 (m, 2H, Ar), 7.64-7.67 (m, 2H, Ar), 7.72-7.77 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 124.6 (q, *J* = 270 Hz), 125.9 (q, *J* = 3.8 Hz), 127.4, 127.6, 128.4, 129.2, 129.5 (q, *J* = 32.4 Hz), 139.9, 144.9 (q, *J* = 1.4 Hz).

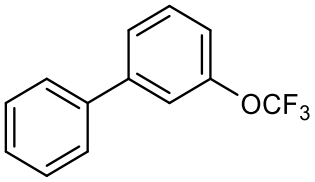


***3-Methyl-1,1'-biphenyl*, 5j.**[29] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless solid, yield 86% (0.120 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.54 (s, 3H, Me), 7.28-7.30 (m, 1H, Ar), 7.43-7.48 (m, 2H, Ar), 7.52-7.57 (m, 4H, Ar), 7.70-7.73 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.7, 124.4, 127.3, 127.4, 128.1, 128.2, 128.8, 128.9, 138.5, 141.4, 141.5.

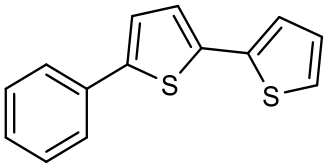
[26] F. Berthiol, H. Doucet and M. Santelli, *Eur. J. Org. Chem.*, 2003, 1091-1096.
[27] R. N. Dhital, A. Sen, T. Sato, H. Hu, R. Ishii, D. Hashizume, H. Takaya, Y. Uozumi and Y. M. A. Yamada, *Org. Lett.*, 2020, **22**, 4797-4801.
[28] A. Ohno, T. Sato, T. Mase, Y. Uozumi and Y. M. A. Yamad, *Adv. Synth. Catal.*, 2020, **362**, 4687-4698.
[29] S. Yang and S. H. Hong, *Asian J. Org. Chem.*, 2020, **9**, 1846-1851.



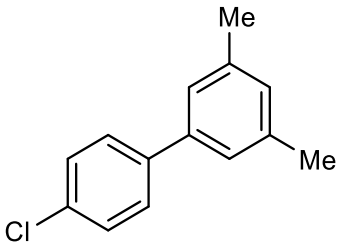
***1,1'-Biphenyl,* 5k.**[30] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless solid, yield 86% (0.110 g, X = Br, method A), 58% (0.074 g, X = OTf, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.42-7.46 (m, 2H, Ar), 7.51-7.56 (m, 4H, Ar), 7.68-7.71 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 127.3, 127.4, 128.9, 141.4.



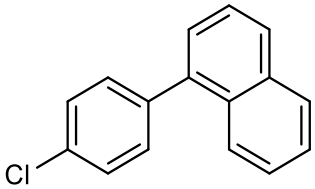
***3-(Trifluoromethoxy)-1,1'-biphenyl,* 5l.**[31] Starting from 0.832 mmol of corresponding silane the product was obtained as a colourless oil, yield 85% (0.169 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.25-7.29 (m, 1H, Ar), 7.42-7.46 (m, 1H, Ar), 7.47-7.53 (m, 4H, Ar), 7.56-7.59 (m, 1H, Ar), 7.61-7.65 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 119.7, 119.9, 120.8 (q, *J* = 255 Hz), 125.7, 127.3, 128.2, 129.1, 130.2, 139.9, 143.6, 149.9 (q, *J* = 1.8 Hz).



***5-Phenyl-2,2'-bithiophene,* 5m.**[32] Starting from 0.832 mmol of corresponding silane the product was obtained as a yellow solid, yield 50% (0.100 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.04-7.07 (m, 1H, Ar), 7.17-7.18 (m, 1H, Ar), 7.22-7.25 (m, 3H, Ar), 7.29-7.34 (m, 1H, Ar), 7.39-7.43 (m, 2H, Ar), 7.62-7.65 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 123.8, 123.9, 124.5, 124.8, 125.8, 127.7, 128.0, 129.1, 134.2, 136.9, 137.6, 143.3.

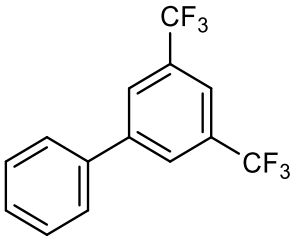


***4'-Chloro-3,5-dimethyl-1,1'-biphenyl,* 5n.**[33] Starting from 0.728 mmol of corresponding silane the product was obtained as a colourless solid, yield 95% (0.150 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.44 (s, 6H, 2xMe), 7.07 (s, 1H, Ar), 7.23 (s, 2H, Ar), 7.42-7.45 (m, 2H, Ar), 7.54-7.56 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.5, 125.1, 128.5, 128.9, 129.2, 129.4, 133.3, 138.6, 140.0, 140.1.

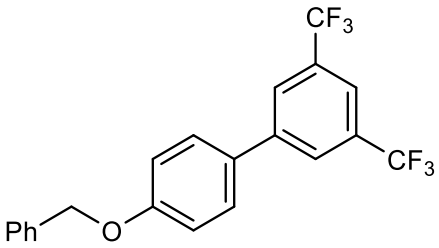


***1-(4-Chlorophenyl)naphthalene,* 5o.**[34] Starting from 0.728 mmol of corresponding silane the product was obtained as a colourless solid, yield 84% (0.145 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.39-7.54 (m, 7H, Ar), 7.64-7.66 (m, 1H, Ar), 7.83-7.93 (m, 3H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 125.4, 125.5, 125.9, 126.1, 126.3, 126.4, 126.7, 127.1, 127.9, 128.2, 128.4, 128.6, 128.7, 128.8, 129.2, 131.5, 131.6, 132.9, 133.5, 133.7, 133.8, 134.0, 137.5, 139.1, 139.4, 139.8.

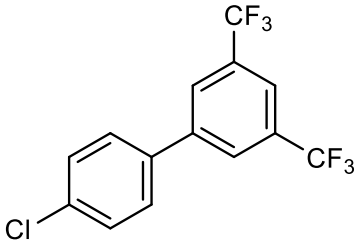
[30] M. Xiaojing, L. Gao, Z. Weng, H. Yang and X. Sun, *New J. Chem.*, 2020, **44**, 20525-20529.
[31] M. Zhou, C. Ni, Z. He and J. Hu, *Org. Lett.*, 2016, **18**, 3754-3757.
[32] M. M. Martinez, M. Pena-Lopez, J. P. Sestelo and L. A. Sarandeses, *Org. Biomol. Chem.*, 2012, **10**, 3892-3898.
[33] P. Pattanayak, D. Patra, P. Brandao, D. Mal and V. Felix, *Inorg. Chem. Commun.*, 2015, **53**, 68-71.
[34] P.-F. Li, C.-B. Yi, S.-J. Ren and J. Qu, *Adv. Synth. Catal.*, 2016, **358**, 2088-2092.



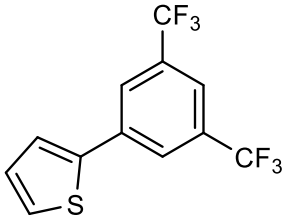
***3,5-Bis(trifluoromethyl)-1,1'-biphenyl*, 7a.**[21] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 99% (0.197 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.45-7.55 (m, 3H, Ar), 7.62-7.66 (m, 2H, Ar), 7.89 (s, 1H, Ar), 8.04 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.1 (p, *J* = 3.9 Hz), 123.6 (q, *J* = 271 Hz), 127.4-127.5 (m), 129.1, 129.5, 132.4 (q, *J* = 33.3 Hz), 138.5, 143.6.



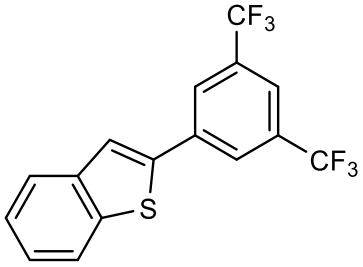
***4'-(Benzyloxy)-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 7b.** Starting from 0.634 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 85% (0.213 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 5.17 (s, 2H, CH_2), 7.13-7.16 (m, 2H, Ar), 7.38-7.42 (m, 1H, Ar), 7.43-7.48 (m, 2H, Ar), 7.50-7.53 (m, 2H, Ar), 7.56-7.59 (m, 2H, Ar), 7.87 (s, 1H, Ar), 8.01 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 70.3, 120.4 (hept, *J* = 3.9 Hz), 123.7 (q, *J* = 271 Hz), 126.8 (q, *J* = 3.7 Hz), 127.7, 128.3, 128.6, 128.9, 131.0, 132.2 (q, *J* = 33.1 Hz), 136.8, 143.0, 159.7. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{21}H_{15}F_6O$ 397.1022 found 397.1028.



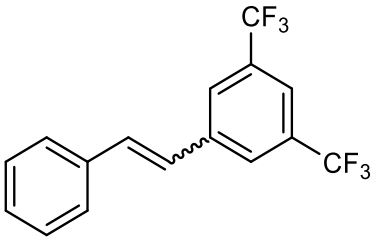
***4'-Chloro-3,5-bis(trifluoromethyl)-1,1'-biphenyl*, 7c.**[24] Starting from 0.697 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 93% (0.210 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.47-7.50 (m, 2H, Ar), 7.54-7.57 (m, 2H, Ar), 7.89 (s, 1H, Ar), 7.99 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.4 (hept, *J* = 3.9 Hz), 123.5 (q, *J* = 271 Hz), 127.2 (q, *J* = 3.8 Hz), 128.7, 129.7, 132.5 (q, *J* = 33.4 Hz), 135.5, 136.8, 142.3.



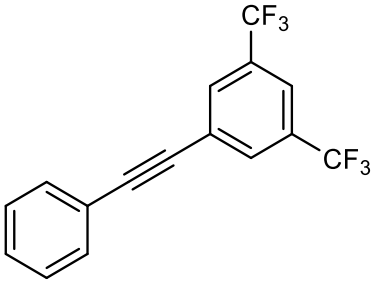
***2-(3,5-Bis(trifluoromethyl)phenyl)thiophene*, 7d.**[25] Starting from 0.670 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 99% (0.198 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.15 (dd, *J* = 5.1, 3.7 Hz, 1H, thiophene), 7.41-7.44 (m, 2H, thiophene), 7.79 (s, 1H, Ar), 8.01 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 120.9 (hept, *J* = 3.8 Hz), 123.4 (q, *J* = 271 Hz), 125.4, 125.8 (q, *J* = 3.9 Hz), 127.2, 128.7, 132.5 (q, *J* = 33.4 Hz), 136.7, 141.1.



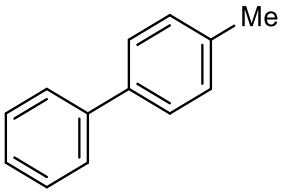
***2-(3,5-Bis(trifluoromethyl)phenyl)benzo[b]thiophene*, 7e.**[24] Starting from 0.709 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 99% (0.245 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.36-7.43 (m, 2H, Ar), 7.62 (s, 1H, Ar), 7.78-7.85 (m, 3H, Ar), 8.08 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.6 (hept, *J* = 3.8 Hz), 122.0, 122.6, 123.4 (q, *J* = 271 Hz), 124.4, 125.2, 125.6, 126.2 (q, *J* = 3.8 Hz), 132.6 (q, *J* = 33.4 Hz), 136.6, 140.0, 140.4, 140.5.



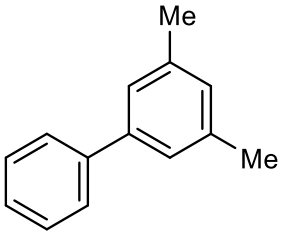
***1-Styryl-3,5-bis(trifluoromethyl)benzene*, 7f.**[35] Starting from 0.712 mmol of corresponding organothin reagent the product was obtained as a colourless oil, yield 82%, E/Z = 10/1.2 (0.185 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 6.60 (d, *J* = 12.1 Hz, 0.12H, olefin, minor isomer), 6.85 (d, *J* = 12.2 Hz, 0.12H, olefin, minor isomer), 7.13 (d, *J* = 16.4 Hz, 1H, olefin, major isomer), 7.18-7.30 (m, 1.84H, Ar, minor isomer/olefin, major isomer), 7.33-7.38 (m, 1H, Ar, major isomer), 7.40-7.44 (m, 2H, Ar, major isomer), 7.50-7.52 (m, 0.14H, Ar, minor isomer), 7.54-7.57 (m, 2H, Ar, major isomer), 7.67-7.70 (m, 0.40H, Ar, minor isomer), 7.77 (s, 1H, Ar, major isomer), 7.92 (s, 2H, Ar, major isomer), 8.02 (s, 0.17H, Ar, minor isomer), 8.04 (s, 0.34H, Ar, minor isomer). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 120.7-120.8 (m), 120.9 (p, *J* = 3.9 Hz), 123.2 (q, *J* = 271 Hz), 123.6 (q, *J* = 271 Hz), 125.7, 126.3 (q, *J* = 3.7 Hz), 127.1, 127.2, 127.3, 127.6, 127.7, 127.9, 128.1, 128.3, 128.8, 129.0, 129.1, 132.2 (q, *J* = 33.0 Hz), 132.7, 133.1 (q, *J* = 33.0 Hz), 134.1, 135.9, 136.2, 138.1, 139.4, 139.6, 140.6, 142.6.



***1-(Phenylethynyl)-3,5-bis(trifluoromethyl)benzene*, 7g.**[36] Starting from 0.716 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 77% (0.173 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.38-7.43 (m, 3H, Ar), 7.56-7.61 (m, 2H, Ar), 7.83 (s, 1H, Ar), 7.97 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 86.5, 93.0, 121.7 (p, *J* = 3.8 Hz), 122.1, 123.2 (q, *J* = 271 Hz), 125.9, 128.8, 129.5, 131.6 (q, *J* = 3.9 Hz), 132.0, 132.2 (q, *J* = 33.0 Hz).

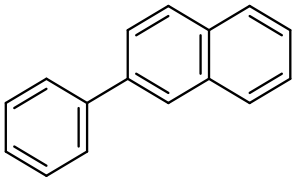


***4-Methyl-1,1'-biphenyl*, 7i.**[37] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 83% (0.095 g, X = Br, method D), 94% (0.108 g, X = Cl, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.49 (s, 3H, Me), 7.33-7.36 (m, 2H, Ar), 7.40-7.44 (m, 1H, Ar), 7.50-7.54 (m, 2H, Ar), 7.58-7.62 (m, 2H, Ar), 7.67-7.70 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.3, 127.1, 127.2, 128.9, 129.7, 137.2, 138.5, 141.3.

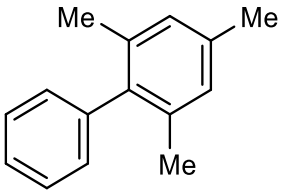


***3,5-Dimethyl-1,1'-biphenyl*, 7j.**[38] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 99% (0.124 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.49 (s, 6H, 2xMe), 7.10 (s, 1H, Ar), 7.33 (s, 2H, Ar), 7.41-7.45 (m, 1H, Ar), 7.50-7.55 (m, 2H, Ar), 7.68-7.71 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.6, 125.3, 127.2, 127.4, 128.8, 129.1, 138.4, 141.4, 141.6.

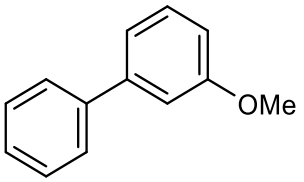
[35] A. N. Baumann, A. Music, J. Dechent, N. Meller, T. C. Jagau and D. Didier, *Chem. Eur. J.*, 2020, **26**, 8382-8387.
[36] R. Zhou, W. Wang, Z.-j. Jiang, H.-y. Fu, X.-l. Zheng, C.-c. Zhang, H. Chen and R.-x. Li, *Catal. Sci. Technol.*, 2014, **4**, 746-751.
[37] J. Ishida, M. Nakatsuji, T. Nagata, H. Kawasaki, T. Suzuki and Y. Obora, *ACS Omega*, 2020, **5**, 9598-9604.
[38] D. Kim, G. Choi, W. Kim, D. Kim, Y. K. Kang and S. H. Hong, *Chem. Sci.*, 2021, **12**, 363-373.



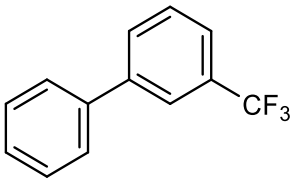
2-Phenylnaphthalene, **7k.**[39] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 99% (0.138 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.44-7.48 (m, 1H, Ar), 7.53-7.60 (m, 4H, Ar), 7.79-7.85 (m, 3H, Ar), 7.92-7.99 (m, 3H, Ar), 8.13 (d, *J* = 1.9 Hz, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 125.8, 126.0, 126.1, 126.4, 127.5, 127.6, 127.8, 128.4, 128.6, 129.0, 132.8, 133.9, 138.7, 141.3.



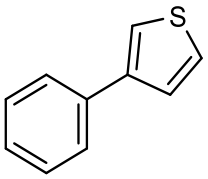
2,4,6-Trimethyl-1,1'-biphenyl, **7l.**[40] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless oil, yield 38% (0.051 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.08 (s, 6H, 2xMe), 2.40 (s, 3H, Me), 7.01 (s, 2H, Ar), 7.19-7.22 (m, 2H, Ar), 7.36-7.42 (m, 1H, Ar), 7.45-7.51 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 20.9, 21.2, 126.7, 127.3, 127.4, 128.2, 128.5, 128.9, 129.5, 136.1, 136.7, 139.2, 141.3.



3-Methoxy-1,1'-biphenyl, **7m.**[41] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 85% (0.106 g, X = Br, method D), 99% (0.125 g, X = Cl, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.90 (m, 3H, OMe), 6.93-6.97 (m, 1H, Ar), 7.18-7.20 (m, 1H, Ar), 7.22-7.25 (m, 1H, Ar), 7.37-7.43 (m, 2H, Ar), 7.46-7.50 (m, 2H, Ar), 7.63-7.66 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.4, 112.8, 113.1, 119.8, 127.4, 127.6, 128.9, 129.9, 141.3, 142.9, 160.1.

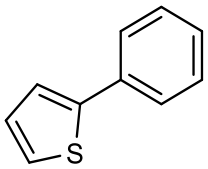


3-(Trifluoromethyl)-1,1'-biphenyl, **7n.**[42] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless oil, yield 64% (0.097 g, method C). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.41-7.46 (m, 1H, Ar), 7.48-7.53 (m, 2H, Ar), 7.56-7.65 (m, 4H, Ar), 7.78-7.81 (m, 1H, Ar), 7.88 (s, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 124.1 (qd, *J* = 3.8, 1.9 Hz), 124.4 (q, *J* = 271 Hz), 127.4, 128.1, 128.2, 129.2, 129.4, 130.6 (d, *J* = 1.5 Hz), 131.4 (q, *J* = 32.2 Hz), 136.7, 140.0, 142.2.

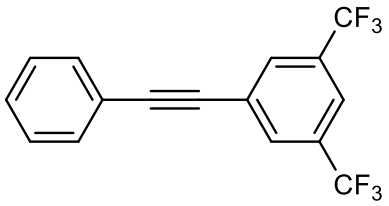


3-Phenylthiophene, **7o.**[43] Starting from 0.681 mmol of corresponding organothin reagent the product was obtained as a colourless oil, yield 90% (0.098 g, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.35-7.40 (m, 1H, thiophene), 7.42-7.52 (m, 5H, Ar/thiophene), 7.66-7.70 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 119.9, 120.4, 126.3, 126.5, 126.6, 127.3, 129.0, 136.0, 142.5.

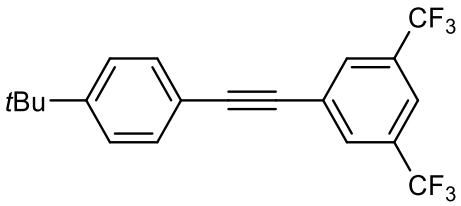
[39] M. M. Talukder, J. M. O. Cue, J. T. Miller, P. L. Gamage, A. Aslam, G. T. McCandless, M. C. Biewer and M. C. Stefan, *ACS Omega*, 2020, **5**, 24018-24032.
[40] G. Pandey and B. Torok, *Green Chem.*, 2017, **19**, 5390-5395.
[41] B. Liu, T. Xu, C. Li and J. Bai, *New J. Chem.*, 2020, **44**, 3794-3801.
[42] P. P. Mpungose, N. I. Sehloko, G. E. M. Maguire and H. B. Friedrich, *New J. Chem.*, 2017, **41**, 13560-13566.
[43] J. Duczynski, A. N. Sobolev, S. A. Moggach, R. Dorta and S. G. Stewart, *Organometallics*, 2020, **39**, 105-115.



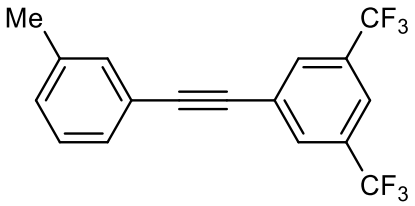
***2-Phenylthiophene*, 7p.**[44] Starting from 0.670 mmol of corresponding organothin reagent the product was obtained as a colourless solid, yield 88% (0.094 g, X = Cl, method D), 71% (0.076 g, X = OTf, method D). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.12-7.15 (m, 1H, thiophene), 7.32-7.38 (m, 3H, Ar/thiophene), 7.41-7.46 (m, 2H, Ar), 7.67-7.70 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 123.2, 124.9, 126.1, 127.6, 128.2, 129.0, 134.6, 144.6.



***1-(Phenylethynyl)-3,5-bis(trifluoromethyl)benzene*, 9a.**[45] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a colourless oil, yield 86% (0.264 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.39-7.44 (m, 3H, Ar), 7.59-7.62 (m, 2H, Ar), 7.85 (s, 1H, Ar), 7.97 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 86.5, 93.0, 121.7 (hept, *J* = 3.8 Hz), 122.2, 123.2 (q, *J* = 271 Hz), 125.9, 128.7, 129.5, 131.6 (q, *J* = 3.9 Hz), 132.1, 132.2 (q, *J* = 34 Hz).

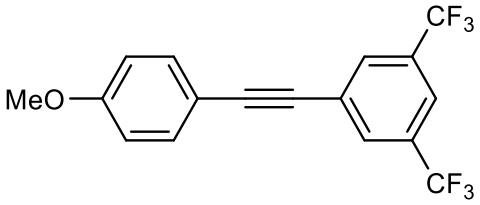


***1-((4-(tert-Butyl)phenyl)ethynyl)-3,5-bis(trifluoromethyl)benzene*, 9b.** Starting from 0.948 mmol of corresponding acetylene the product was obtained as a white solid, yield 93% (0.325 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 1.37 (s, 9H, *t*Bu), 7.44 (d, *J* = 8.8 Hz, 2H, Ar), 7.53 (d, *J* = 8.8 Hz, 2H, Ar), 7.83 (s, 1H, Ar), 7.97 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 31.3, 35.1, 86.0, 93.4, 119.1, 121.5 (p, *J* = 3.8 Hz), 123.3 (q, *J* = 272 Hz), 125.8, 126.2, 131.6 (q, *J* = 4.0 Hz), 131.8, 132.1 (q, *J* = 34 Hz), 153.0. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{20}H_{17}F_6$ 371.1229 found 371.1231.

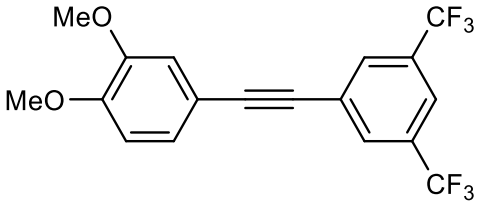


***1-(m-Tolylethynyl)-3,5-bis(trifluoromethyl)benzene*, 9c.** Starting from 0.947 mmol of corresponding acetylene the product was obtained as a colourless oil, yield 92% (0.285 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.40 (s, 3H, Me), 7.23 (d, *J* = 7.7 Hz, 1H, Ar), 7.30 (t, *J* = 7.6 Hz, 1H, Ar), 7.39-7.42 (m, 2H, Ar), 7.83 (s, 1H, Ar), 7.96 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 86.2, 93.3, 121.6 (hept, *J* = 3.9 Hz), 121.9, 123.2 (q, *J* = 271 Hz), 126.0, 128.6, 129.1, 130.4, 131.6 (q, *J* = 4.0 Hz), 132.1 (q, *J* = 33 Hz), 132.6, 138.5. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{17}H_{11}F_6$ 329.0759 found 329.0755.

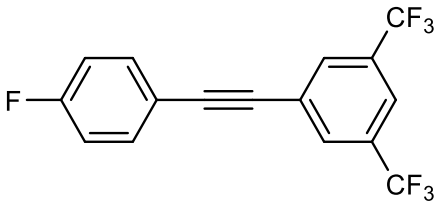
[44] B. Karimi, M. Tavakolian, F. Mansouri and H. Vali, *ACS Sustainable Chem. Eng.*, 2019, **7**, 3811-3823.
[45] R. Zhou, W. Wang, Z.-j. Jiang, H.-y. Fu, X.-l. Zheng, C.-c. Zhang, H. Chen and R.-x. Li, *Catal. Sci. Technol.*, 2014, **4**, 746-751.



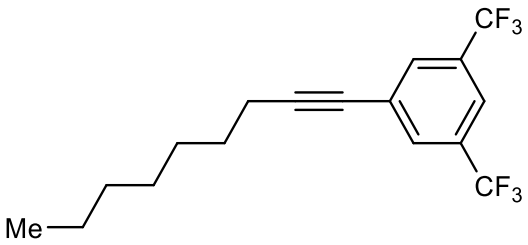
1-((4-Methoxyphenyl)ethynyl)-3,5-bis(trifluoromethyl)benzene, **9d.**[46] Starting from 0.984 mmol of corresponding acetylene the product was obtained as a white solid, yield 87% (0.295 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.84 (s, 3H, OMe), 6.92 (d, *J* = 8.4 Hz, 2H, Ar), 7.50-7.52 (m, 2H, Ar), 7.80 (s, 1H, Ar), 7.93 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.4, 85.5, 93.3, 114.1, 114.4, 121.3 (p, *J* = 3.9 Hz), 123.2 (q, *J* = 271 Hz), 126.3, 131.4 (q, *J* = 3.8 Hz), 132.1 (q, *J* = 33.6 Hz), 133.6, 160.6.



4-((3,5-bis(Trifluoromethyl)phenyl)ethynyl)-1,2-dimethoxybenzene, **9e.** Starting from 0.987 mmol of corresponding acetylene the product was obtained as a white solid, yield 97% (0.358 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.88 (d, *J* = 2.5 Hz, 6H, 2xOMe), 6.83 (d, *J* = 8.3 Hz, 1H, Ar), 7.03 (d, *J* = 1.8 Hz, 1H, Ar), 7.14 (dd, *J* = 8.3, 1.9 Hz, 1H, Ar), 7.76 (s, 1H, Ar), 7.90 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.9, 56.0, 85.2, 93.3, 111.2, 114.1, 114.4, 121.2 (hept, *J* = 3.9 Hz), 123.1 (q, *J* = 272 Hz), 125.5, 126.1, 131.3 (q, *J* = 3.9 Hz), 132.0 (q, *J* = 33.6 Hz), 148.9, 150.5. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{18}H_{13}F_6O_2$ 375.0814 found 375.0807.

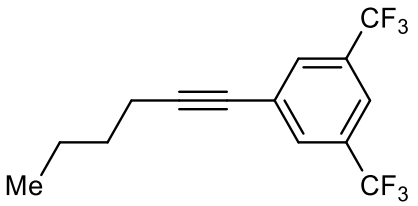


1-((4-Fluorophenyl)ethynyl)-3,5-bis(trifluoromethyl)benzene, **9f.** Starting from 0.999 mmol of corresponding acetylene the product was obtained as a white solid, yield 93% (0.307 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.06-7.11 (m, 2H, Ar), 7.55 (dd, *J* = 8.4, 5.3 Hz, 2H, Ar), 7.83 (s, 1H, Ar), 7.94 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 86.3, 91.9, 116.1 (d, *J* = 22.2 Hz), 118.3 (d, *J* = 3.5 Hz), 121.7-121.9 (m), 123.2 (q, *J* = 271 Hz), 125.8, 131.6 (q, *J* = 3.7 Hz), 132.2 (q, *J* = 33.7 Hz), 134.0 (d, *J* = 8.5 Hz), 163.4 (d, *J* = 251.4 Hz). **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{16}H_8F_7$ 333.0509 found 333.0511.

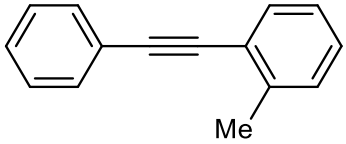


1-(Non-1-yn-1-yl)-3,5-bis(trifluoromethyl)benzene, **9g.** Starting from 0.966 mmol of corresponding acetylene the product was obtained as a colourless oil, yield 72% (0.235 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 0.87-0.92 (m, 3H, Me), 1.28-1.39 (m, 6H, 3xCH_2), 1.46 (p, *J* = 6.7 Hz, 2H, CH_2), 1.63 (p, *J* = 7.2 Hz, 2H, CH_2), 2.44 (t, *J* = 7.1 Hz, 2H, CH_2), 7.75 (s, 1H, Ar), 7.81 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 14.2, 19.6, 22.9, 28.6, 29.0, 29.1, 31.9, 78.3, 94.9, 121.0 (p, *J* = 3.7 Hz), 123.3 (q, *J* = 271 Hz), 126.7, 131.7 (q, *J* = 3.9 Hz), 132.0 (q, *J* = 33 Hz). **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{17}H_{19}F_6$ 337.1385 found 337.1383.

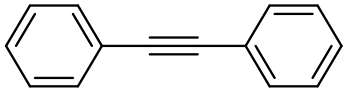
[46] J. He, K. Yang, J. Zhao and S. Cao, *Org. Lett.*, 2019, **21**, 9714-9718.



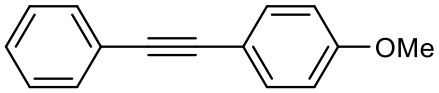
***1-(Hex-1-yn-1-yl)-3,5-bis(trifluoromethyl)benzene*, 9h.**[47] Starting from 0.974 mmol of corresponding acetylene the product was obtained as a colourless oil, yield 99% (0.286 g, method A). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 0.97 (t, *J* = 7.3 Hz, 3H, Me), 1.45-1.54 (m, 2H, CH_2), 1.58-1.66 (m, 2H, CH_2), 2.44 (t, *J* = 7.0 Hz, 2H, CH_2), 7.74 (s, 1H, Ar), 7.81 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 13.7, 19.2, 22.3, 30.7, 78.3, 94.8, 121.0 (hept, *J* = 3.9 Hz), 123.3 (q, *J* = 271 Hz), 126.7, 131.7 (q, *J* = 3.8 Hz), 132.0 (q, *J* = 33 Hz).



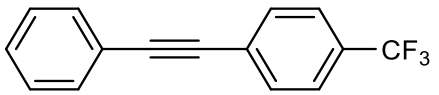
***1-Methyl-2-(phenylethynyl)benzene*, 9i.**[48] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 58% (0.109 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.58-2.59 (m, 3H, Me), 7.20-7.25 (m, 1H, Ar), 7.28-7.29 (m, 2H, Ar), 7.35-7.42 (m, 3H, Ar), 7.55-7.62 (m, 3H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 88.5, 93.5, 123.2, 123.7, 125.8, 128.3, 128.4, 128.5, 129.6, 131.7, 132.0, 140.3.



***1,2-Diphenylethyne*, 9j.**[49] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 99% (0.174 g, X = Br, method B), 90% (0.157 g, X = OTf, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.36-7.43 (m, 6H, Ar), 7.59-7.63 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 89.6, 123.4, 128.4, 128.5, 131.8.



***1-Methoxy-4-(phenylethynyl)benzene*, 9k.**[50] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 97% (0.197 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.83 (s, 3H, OMe), 6.90-6.94 (m, 2H, Ar), 7.33-7.41 (m, 3H, Ar), 7.52-7.61 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.3, 88.2, 89.6, 114.1, 115.5, 123.7, 128.1, 128.4, 131.6, 133.2, 159.7.



***1-(Phenylethynyl)-4-(trifluoromethyl)benzene*, 9l.**[51] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 91% (0.220 g, X = Br, method A), 7% (0.018 g, X = Cl, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.39-7.42 (m, 3H, Ar), 7.59-7.68 (m, 6H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 88.2, 92.0, 122.8, 124.2 (q, *J* = 270 Hz), 125.4 (q, *J* = 3.8 Hz), 127.3 (q, *J* = 1.5 Hz), 128.6, 129.0, 130.1 (q, *J* = 32.6 Hz), 131.9, 132.0.

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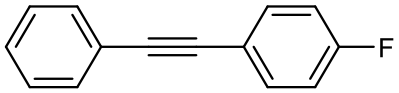
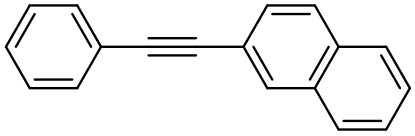
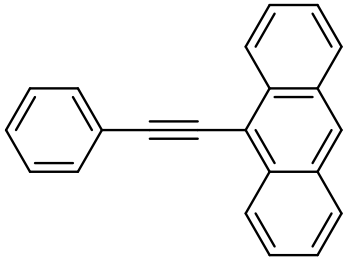
[47] S. R. Chidipudi, I. Khan and H. W. Lam, *Angew. Chem. Int. Ed.*, 2012, **51**, 12115-12119.
[48] F. Messa, G. Dilauro, F. M. Perna, P. Vitale, V. Capriati and A. Salomone, *ChemCatChem*, 2020, **12**, 1979-1984.
[49] S. Alapour, M. D. Farahani, D. Ramjugernath, N. A. Koorbanally and H. B. Friedrich, *ACS Sustainable Chem. Eng.*, 2019, **7**, 12697-12706.
[50] G. Hamasaka, D. Roy, A. Tazawa and Y. Uozumi, *ACS Catal.*, 2019, **9**, 11640-11646.
[51] T. Tani, Y. Sawatsugawa, Y. Sano, Y. Hirataka, N. Takahashi, S. Hashimoto, T. Sugiura and T. Tsuchimoto, *Adv. Synth. Catal.*, 2019, **361**, 1815-1834.



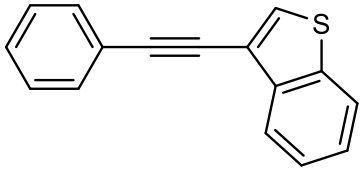
***1-Fluoro-4-(phenylethynyl)benzene*, 9m.**[52] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 70% (0.134 g, method A), 99% (0.191 g, method B). For gram-scale experiment starting from 9.790 mmol (1 g) of corresponding acetylene the product was obtained as a white solid, yield 87% (1.673 g). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.04-7.10 (m, 2H, Ar), 7.36-7.41 (m, 3H, Ar), 7.52-7.59 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 88.5, 89.2 (d, *J* = 1.5 Hz), 115.8 (d, *J* = 22.0 Hz), 119.5 (d, *J* = 3.4 Hz), 123.3, 128.4, 128.5, 131.7, 133.6 (d, *J* = 8.3 Hz), 162.6 (d, *J* = 249.5 Hz).



***2-(Phenylethynyl)naphthalene*, 9n.**[53] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a yellow solid, yield 99% (0.223 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.40-7.48 (m, 3H, Ar), 7.54-7.59 (m, 2H, Ar), 7.68-7.72 (m, 3H, Ar), 7.87-7.90 (m, 3H, Ar), 8.16 (s, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 89.9, 90.0, 120.7, 123.5, 126.7, 126.8, 127.9, 127.9, 128.2, 128.4, 128.5, 128.6, 131.6, 131.8, 132.9, 133.2.

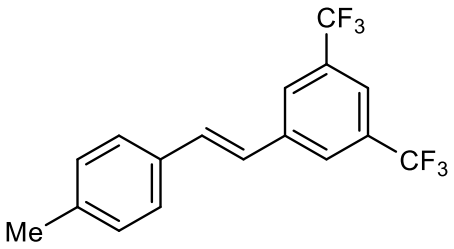


***9-(Phenylethynyl)anthracene*, 9o.**[54] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a yellow solid, yield 98% (0.268 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.49-7.61 (m, 5H, Ar), 7.72 (ddd, *J* = 8.5, 6.6, 1.3 Hz, 2H, Ar), 7.92-7.95 (m, 2H, Ar), 8.05 (d, *J* = 8.5 Hz, 2H, Ar), 8.41 (s, 1H, Ar), 8.83 (dd, *J* = 8.7, 1.2 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 86.6, 100.9, 117.3, 123.8, 125.7, 126.7, 126.8, 127.8, 128.5, 128.6, 128.8, 131.2, 131.8, 132.7.

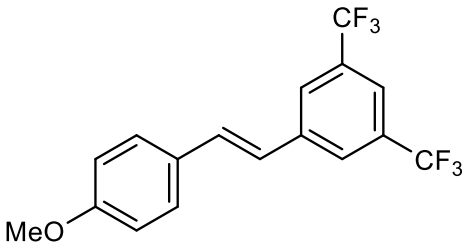


***3-(Phenylethynyl)benzo[b]thiophene*, 9p.**[55] Starting from 0.979 mmol of corresponding acetylene the product was obtained as a white solid, yield 97% (0.223 g, method B). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.37-7.50 (m, 4H, Ar), 7.51-7.56 (m, 1H, Ar), 7.66-7.70 (m, 2H, Ar), 7.73 (s, 1H, Ar), 7.90-7.92 (m, 1H, Ar), 8.11-8.14 (m, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 83.2, 92.0, 118.5, 122.8, 123.2, 123.3, 124.9, 125.2, 128.5, 128.6, 129.9, 131.8, 139.0, 139.3.

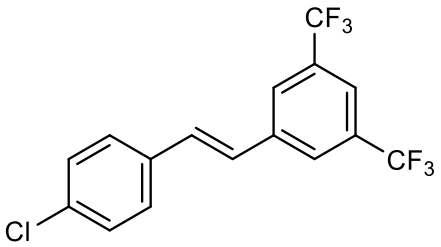
[52] S. Ruengsangtongkul, N. Chaisan, C. Thongsornkleeb, J. Tummatorn and S. Ruchirawat, *Org. Lett.*, 2019, **21**, 2514-2517.
[53] A. Baralle, H. Yorimitsu and A. Osuka, *Chem. Eur. J.*, 2016, **22**, 10768-10772.
[54] Y. Thummala, A. K. Morri, G. V. Karunakar and V. R. Doddi, *Eur. J. Org. Chem.*, 2018, 6280-6285.
[55] S. Prateeptongkum, K. M. Driller, R. Jackstell, A. Spannenberg and M. Beller, *Chem. Eur. J.*, 2010, **16**, 9606-9615.



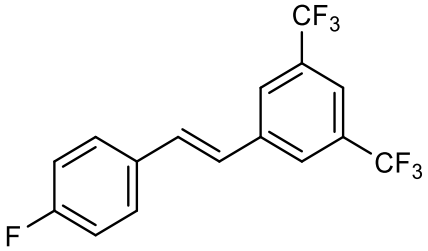
***(E)-1-(4-Methylstyryl)-3,5-bis(trifluoromethyl)benzene*, 11a.**[56] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 94% (0.262 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.53 (s, 3H, Me), 7.20 (d, *J* = 16.5 Hz, 1H, olefin), 7.32-7.36 (m, 3H, Ar/olefin), 7.58 (d, *J* = 8.5 Hz, 2H, Ar), 7.88 (s, 1H, Ar), 8.03 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 120.7 (hept, *J* = 3.9 Hz), 123.6 (q, *J* = 271 Hz), 124.7, 126.2 (q, *J* = 3.7 Hz), 127.1, 127.7, 127.9, 129.5, 129.8, 132.2 (q, *J* = 33 Hz), 132.6, 133.4, 139.1, 139.8.



***(E)-1-(4-Methoxystyryl)-3,5-bis(trifluoromethyl)benzene*, 11b.** Starting from 0.894 mmol of corresponding olefin the product was obtained as a colourless solid, yield 94% (0.291 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.85 (s, 3H, OMe), 6.94-6.99 (m, 3H, Ar/olefin), 7.18 (d, *J* = 16.3 Hz, 1H, olefin), 7.47-7.51 (m, 2H, Ar), 7.73 (s, 1H, Ar), 7.87 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 55.4, 114.5, 120.4 (hept, *J* = 3.8 Hz), 123.4, 123.6 (q, *J* = 271 Hz), 126.0 (q, *J* = 4.0 Hz), 128.5, 128.9, 132.1 (q, *J* = 33 Hz), 132.2, 140.0, 160.4. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{17}H_{13}F_6O$ 347.0865 found 347.0862.

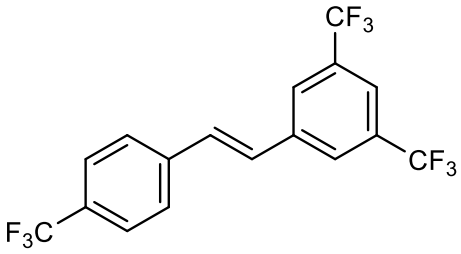


***(E)-1-(4-Chlorostyryl)-3,5-bis(trifluoromethyl)benzene*, 11c.** Starting from 0.866 mmol of corresponding olefin the product was obtained as a colourless solid, yield 97% (0.295 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.07 (d, *J* = 16.6 Hz, 1H, olefin), 7.17 (d, *J* = 16.4 Hz, 1H, olefin), 7.35-7.38 (m, 2H, Ar), 7.45-7.47 (m, 2H, Ar), 7.77 (s, 1H, Ar), 7.90 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.2 (p, *J* = 3.9 Hz), 123.5 (q, *J* = 271 Hz), 126.2, 126.3 (q, *J* = 3.7 Hz), 128.2, 129.1, 129.2, 129.3, 131.3, 132.3 (q, *J* = 33.2 Hz), 134.7, 139.3. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{16}H_{10}ClF_6$ 351.0370 found 351.0377.

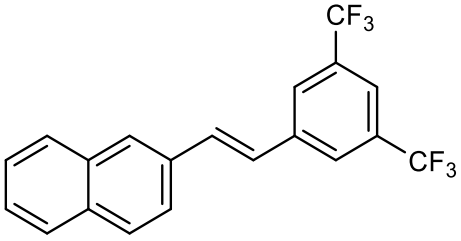


***(E)-1-(4-Fluorostyryl)-3,5-bis(trifluoromethyl)benzene*, 11d.** Starting from 0.819 mmol of corresponding olefin the product was obtained as a colourless oil, yield 82% (0.225 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.02 (d, *J* = 16.3 Hz, 1H, olefin), 7.07-7.12 (m, 2H, Ar), 7.19 (d, *J* = 16.3 Hz, 1H, olefin), 7.49-7.53 (m, 2H, Ar), 7.76 (s, 1H, Ar), 7.89 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 116.1 (d, *J* = 21.9 Hz), 121.0 (hept, *J* = 3.8 Hz), 123.6 (q, *J* = 271 Hz), 125.5 (d, *J* = 2.5 Hz), 126.2 (q, *J* = 3.8 Hz), 128.7 (d, *J* = 8.1 Hz), 131.4, 132.3 (q, *J* = 33 Hz),132.4, 139.5, 163.2 (d, *J* = 249.1 Hz). **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{16}H_{10}F_7$ 335.0665 found 335.0670.

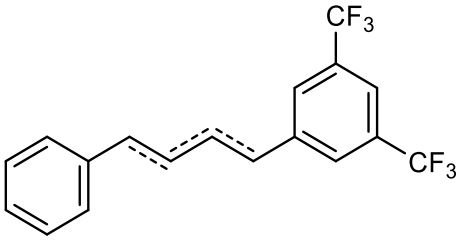
[56] M. S. M. Pearson and D. R. Carbery, *J. Org. Chem.*, 2009, **74**, 5320-5325.



***(E)-1,3-Bis(trifluoromethyl)-5-(4-(trifluoromethyl)styryl)benzene*, 11e.**[57] Starting from 0.871 mmol of corresponding olefin the product was obtained as a colourless oil, yield 80% (0.269 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.19 (d, *J* = 16.3 Hz, 1H, olefin), 7.25 (d, *J* = 16.2 Hz, 1H, olefin), 7.61-7.67 (m, 4H, Ar), 7.79 (s, 1H, Ar), 7.94 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 121.6 (p, *J* = 3.8 Hz), 123.9 (q, *J* = 271 Hz), 124.3 (q, *J* = 271 Hz), 126.1 (q, *J* = 3.8 Hz), 126.6 (q, *J* = 3.6 Hz), 127.2, 128.1, 130.7 (q, *J* = 33.4 Hz), 131.1, 132.5 (q, *J* = 33.4 Hz), 139.0, 139.6-139.7 (m).



***(E)-2-(3,5-Bis(trifluoromethyl)styryl)naphthalene*, 11f.** Starting from 0.843 mmol of corresponding olefin the product was obtained as a colourless solid, yield 93% (0.286 g, method E). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.13 (d, *J* = 16.2 Hz, 1H, olefin), 7.32 (d, *J* = 16.4 Hz, 1H, olefin), 7.54-7.60 (m, 2H, Ar), 7.72 (d, *J* = 8.6 Hz, 1H, Ar), 7.87-7.90 (m, 5H, Ar), 7.94 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 120.8 (p, *J* = 3.9 Hz), 123.3, 123.6 (q, *J* = 271 Hz), 125.6, 126.2 (q, *J* = 3.9 Hz), 126.7, 126.8, 127.9, 128.0, 128.4, 128.7, 132.1 (q, *J* = 33.4 Hz), 132.5, 133.6, 133.7, 133.7, 139.5. **HRMS-EI** (m/z) $[M+H]^+$ calcd. for $C_{20}H_{13}F_6$ 367.0916 found 367.0910.



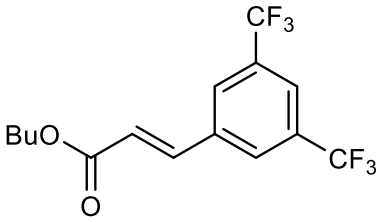
***Mixture of 1-(4-phenylbut-1-en-1-yl)-3,5-bis(trifluoromethyl)benzene, 1-(4-phenylbut-2-en-1-yl)-3,5-bis(trifluoromethyl)benzene and 1-(4-phenylbut-3-en-1-yl)-3,5-bis(trifluoromethyl)benzene*, 11g.**[58] Starting from 0.832 mmol of corresponding olefin the product was obtained as a colourless oil, yield 82% (0.235 g, method E).

Fraction 1: **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.57-2.62 (m, 1.81H, CH_2), 2.78-2.87 (m, 2.45H, CH_2), 3.45 (dd, *J* = 27.6, 6.8 Hz, 0.27H, CH_2), 3.61 (d, *J* = 7.6 Hz, 0.31H, CH_2), 6.43-6.49 (m, 1.67H, olefin), 7.15-7.19 (m, 0.61H, olefin), 7.22-7.27 (m, 3.25H, Ar), 7.29-7.34 (m, 2.59H, Ar), 7.65-7.73 (m, 3H, Ar), 7.79-7.82 (m, 0.73H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 16.0, 21.2, 34.7, 35.0, 35.3, 35.6, 37.0, 116.1, 120.5 (hept, *J* = 4.0 Hz), 121.2-121.3 (m), 122.3, 123.6 (q, *J* = 271 Hz), 125.0, 126.0 (q, *J* = 3.5 Hz), 126.3, 126.4, 126.5, 127.7, 127.8, 128.2, 128.3, 128.4, 128.6, 128.7, 128.8, 128.9, 130.5, 130.6, 131.5, 131.7, 132.0 (q, *J* = 33.4 Hz), 132.1, 132.4, 132.9, 133.0, 133.6, 134.5, 135.4, 140.0, 140.2, 141.2, 141.4, 143.6, 145.8.

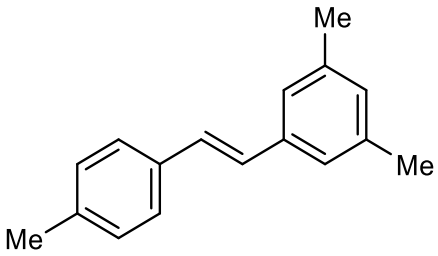
Fraction 2: **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 3.03-3.10 (m, 2.77H, CH_2), 3.19 (t, *J* = 7.5 Hz, 0.28H, CH_2), 3.32 (t, *J* = 7.8 Hz, 1H, CH_2), 3.41 (t, *J* = 7.8 Hz, 1.78H, CH_2), 3.49 (t, *J* = 7.6 Hz, 0.29H, CH_2), 3.94 (dd, *J* = 28.2, 6.8 Hz, 0.44H, CH_2), 6.65-6.73 (m, 0.89H, olefin), 6.90-6.94 (m, 1.81H, olefin), 7.67-7.72 (m, 3.28H, Ar), 7.77-7.83 (m, 4.91H, Ar), 8.13-8.23 (m, 4.57H, Ar), 8.38 (s, 0.44H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 32.3, 34.3, 34.5, 35.0, 35.6, 35.7, 38.6, 39.1, 120.3 (p, *J* = 4.0 Hz), 120.5 (p, *J* =

[57] P. d. Medina, R. Casper, J.-F. Savouret and M. Poirot, *J. Med. Chem.*, 2005, **48**, 287-291.
[58] C.-C. Tseng, M. Li, B. Mo, S. A. Warren and A. C. Spivey, *Chem. Lett.*, 2011, **40**, 995-997.

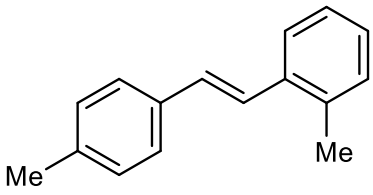
3.8 Hz), 123.5 (q, *J* = 272 Hz), 123.6 (q, *J* = 271 Hz), 126.0 (q, *J* = 4.1 Hz), 126.2, 126.3, 126.4, 126.8, 127.5, 128.2, 128.3, 128.4, 128.5, 128.6, 128.7, 128.8, 128.8-128.9 (m), 129.3, 131.7, 131.8 (q, *J* = 32 Hz), 132.0 (q, *J* = 33.4 Hz), 133.0, 134.5, 137.4, 139.0, 139.9, 140.0, 140.3, 141.4, 143.1, 143.4, 144.0, 144.2.



***Butyl (E)-3-(3,5-bis(trifluoromethyl)phenyl)acrylate*, 11h.**[59] Starting from 0.858 mmol of corresponding olefin the product was obtained as a colourless solid, yield 90% (0.262 g, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 0.95 (t, *J* = 7.4 Hz, 3H, Me), 1.44 (h, *J* = 7.4 Hz, 2H, CH_2), 1.69 (p, *J* = 6.4 Hz, 2H, CH_2), 4.23 (t, *J* = 7.4 Hz, 2H, CH_2), 6.58 (d, *J* = 16.0 Hz, 1H, olefin), 7.71 (d, *J* = 16.1 Hz, 1H, olefin), 7.85 (s, 1H, Ar), 7.94 (s, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 13.8, 19.3, 30.9, 65.1, 122.5, 123.2 (q, *J* = 272 Hz), 123.4 (hept, *J* = 3.8 Hz), 127.8 (q, *J* = 3.9 Hz), 132.6 (q, *J* = 33.6 Hz), 136.8, 141.0, 166.1.

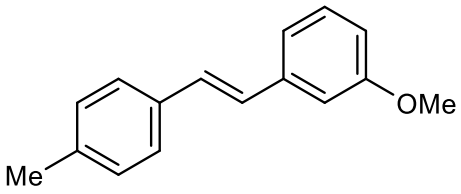


***(E)-1,3-Dimethyl-5-(4-methylstyryl)benzene*, 11k.**[60] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 86% (0.161 g, method E), 86% (0.162 g, method F). For isolations based on the use of renewable monoterpenes starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 90% (0.170 g, (−)-α-pinene), 91% (0.172 g, 3-carene), 86% (0.161 g, (*R*)-(+)-limonene), 89% (0.167 g, γ-terpinene), 87% (0.163 g, sabinene). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.65-2.67 (m, 9H, 3xMe), 7.21 (s, 1H, Ar), 7.32 (d, *J* = 16.4 Hz, 1H, olefin), 7.39 (d, *J* = 16.2 Hz, 1H, olefin), 7.45-7.48 (m, 4H, Ar), 7.72 (d, *J* = 7.8 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 21.5, 124.5, 126.5, 128.0, 128.3, 129.4, 129.5, 134.9, 137.4, 137.6, 138.1.

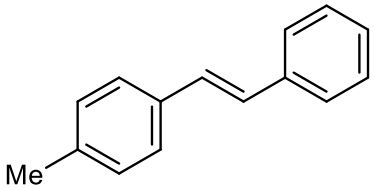


***(E)-1-Methyl-2-(4-methylstyryl)benzene*, 11l.**[61] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless oil, yield 58% (0.102 g, method E), 95% (0.167 g, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.48 (s, 3H, Me), 2.55 (s, 3H, Me), 7.10 (d, *J* = 16.1 Hz, 1H, olefin), 7.28-7.35 (m, 5H, Ar), 7.42 (d, *J* = 16.1 Hz, 1H, olefin), 7.54 (d, *J* = 8.4 Hz, 2H, Ar), 7.71 (d, *J* = 7.9 Hz, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 20.1, 21.4, 125.4, 125.7, 126.3, 126.6, 127.5, 129.5, 130.1, 130.5, 135.1, 135.8, 136.7, 137.6.

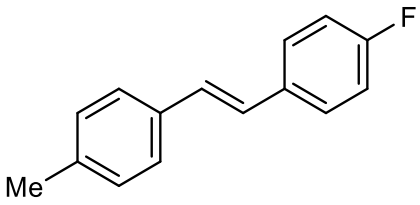
[59] M. Feuerstein, H. Doucet and M. Santelli, *J. Org. Chem.*, 2001, **66**, 5923-5925.
[60] K. Song, P. Liu, J. Wang, L. Pang, J. Chen, I. Hussain, B. Tan and T. Li, *Dalton Trans.*, 2015, **44**, 13906-13913.
[61] E. Shirakawa, X. Zhang and T. Hayashi, *Angew. Chem. Int. Ed.*, 2011, **50**, 4671-4674.



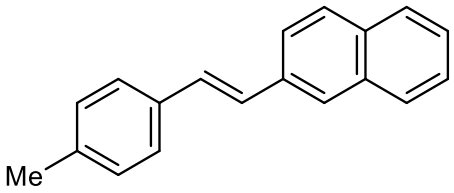
***(E)-1-Methoxy-3-(4-methylstyryl)benzene*, 11m.**[62] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 87% (0.165 g, X = Br, method F), 71% (0.134 g, X = Cl, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.61 (s, 3H, Me), 4.08 (s, 3H, OMe), 7.06 (d, *J* = 8.2 Hz, 1H, olefin), 7.30-7.36 (m, 4H, Ar/olefin), 7.42 (d, *J* = 7.8 Hz, 2H, Ar), 7.52 (t, *J* = 8.0 Hz, 1H, Ar), 7.66 (d, *J* = 7.1 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 55.3, 111.8, 113.2, 119.3, 126.6, 127.7, 129.1, 129.5, 129.7, 134.6, 137.7, 139.1, 160.0.



***(E)-1-Methyl-4-styrylbenzene*, 11n.**[63] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 99% (0.164 g, X = Br, method F), 0% (0 g, X = OTf, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.66 (s, 3H, Me), 7.34-7.43 (m, 2H, olefin), 7.47 (d, *J* = 7.8 Hz, 2H, Ar), 7.54-7.57 (m, 1H, Ar), 7.63-7.67 (m, 2H, Ar), 7.72 (d, *J* = 8.5 Hz, 2H, Ar), 7.81 (d, *J* = 7.7 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 126.5, 126.6, 127.5, 127.8, 128.7, 128.8, 129.5, 134.7, 137.5, 137.6.

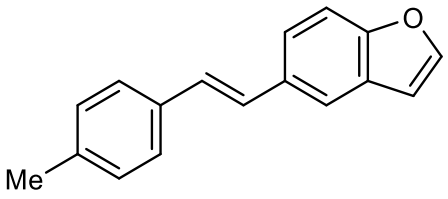


***(E)-1-Fluoro-4-(4-methylstyryl)benzene*, 11o.**[64] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 73% (0.131 g, X = Br, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.40 (s, 3H, Me), 7.00-7.10 (m, 4H, Ar/olefin), 7.20 (d, *J* = 7.8 Hz, 2H, Ar), 7.43 (d, *J* = 7.8 Hz, 2H, Ar), 7.49 (dd, *J* = 8.4, 5.4 Hz, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 115.6, 115.8, 126.5, 126.6, 128.0 (d, *J* = 7.9 Hz), 128.6 (d, *J* = 2.5 Hz), 129.6, 133.9 (d, *J* = 3.4 Hz), 134.6, 137.7, 162.4 (d, *J* = 246.8 Hz).

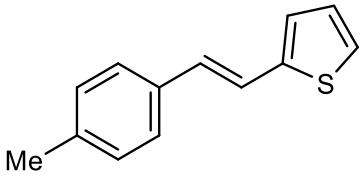


***(E)-2-(4-Methylstyryl)naphthalene*, 11p.**[65] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless solid, yield 64% (0.132 g, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.39 (s, 3H, Me), 7.18-7.23 (m, 4H, Ar/olefin), 7.42-7.51 (m, 4H, Ar), 7.75 (dd, *J* = 8.6, 1.8 Hz, 1H, Ar), 7.80-7.86 (m, 4H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.5, 123.7, 126.0, 126.5, 126.6, 126.7, 127.9, 128.0, 128.1, 128.4, 129.2, 129.6, 133.1, 133.9, 134.8, 135.2, 137.8.

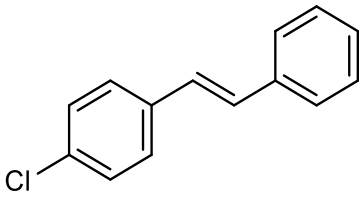
[62] S. Kumar, A. K. Pandey, R. Singh and K. N. Singh, *Eur. J. Org. Chem.*, 2018, 5942-5946.
[63] D. Gong, B. Hu, W. Yang, D. Kong, H. Xia and D. Chen, *Organometallics*, 2020, **39**, 862-869.
[64] A. L. Isfahani, I. Mohammadpoor-Baltork, V. Mirkhani, A. R. Khosropour, M. Moghadam, S. Tangestaninejad and R. Kia, *Adv. Synth. Catal.*, 2013, **355**, 957-972.
[65] S. M. Sutar, H. M. Savanur, S. S. Malunavar, P. Prabhala, R. G. Kalkhambkar and K. K. Laali, *Eur. J. Org. Chem.*, 2019, 6088-6093.



***(E)-5-(4-Methylstyryl)benzofuran*, 11q.**[66] Starting from 0.846 mmol of corresponding olefin the product was obtained as a yellow solid, yield 69% (0.136 g, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.43 (s, 3H, Me), 6.80 (d, *J* = 2.2 Hz, 1H, Ar), 7.13 (d, *J* = 16.3 Hz, 1H, olefin), 7.21-7.25 (m, 3H, Ar/olefin), 7.48-7.50 (m, 2H, Ar), 7.54 (d, *J* = 1.3 Hz, 2H, Ar), 7.66 (d, *J* = 2.2 Hz, 1H, Ar), 7.75-7.76 (m, 1H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 106.8, 111.6, 119.2, 123.1, 126.4, 127.8, 128.0, 128.1, 129.5, 132.8, 134.9, 137.4, 145.6, 154.8.



***(E)-2-(4-Methylstyryl)thiophene*, 11r.**[67] Starting from 0.846 mmol of corresponding olefin the product was obtained as a colourless oil, yield 37% (0.062 g, method F). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 2.39 (s, 3H, Me), 6.95 (d, *J* = 16.1 Hz, 1H, olefin), 7.03 (dd, *J* = 5.1, 3.5 Hz, 1H, thiophene), 7.07-7.08 (m, 1H, thiophene), 7.18-7.24 (m, 4H, Ar/thiophene/olefin), 7.39-7.41 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 21.4, 121.0, 124.2, 125.9, 126.4, 127.7, 128.5, 129.6, 134.3, 137.7, 143.3.

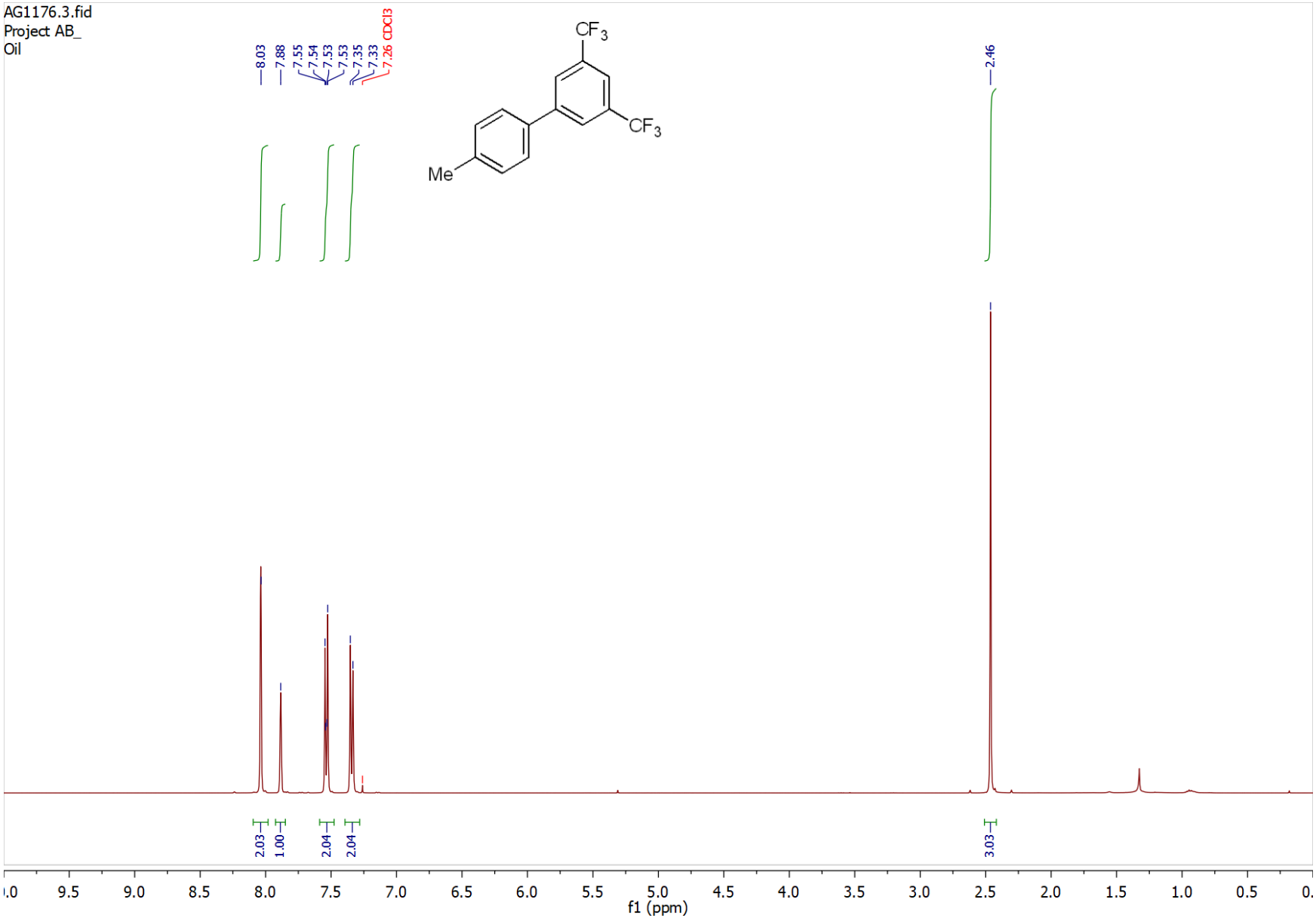


***(E)-1-Chloro-4-styrylbenzene*, 11s.**[68] Starting from 7.216 mmol (1 g) of corresponding olefin the product was obtained as a colourless solid, yield 96% (1.496 g). **^{1}H NMR** (400 MHz, $CDCl_3$): δ = 7.03-7.12 (m, 2H, olefin), 7.27-7.40 (m, 5H, Ar), 7.43-7.47 (m, 2H, Ar), 7.51-7.53 (m, 2H, Ar). **^{13}C NMR** (101 MHz, $CDCl_3$): δ = 126.7, 127.5, 127.8, 128.0, 128.9, 129.0, 129.5, 133.3, 136.0, 137.2.

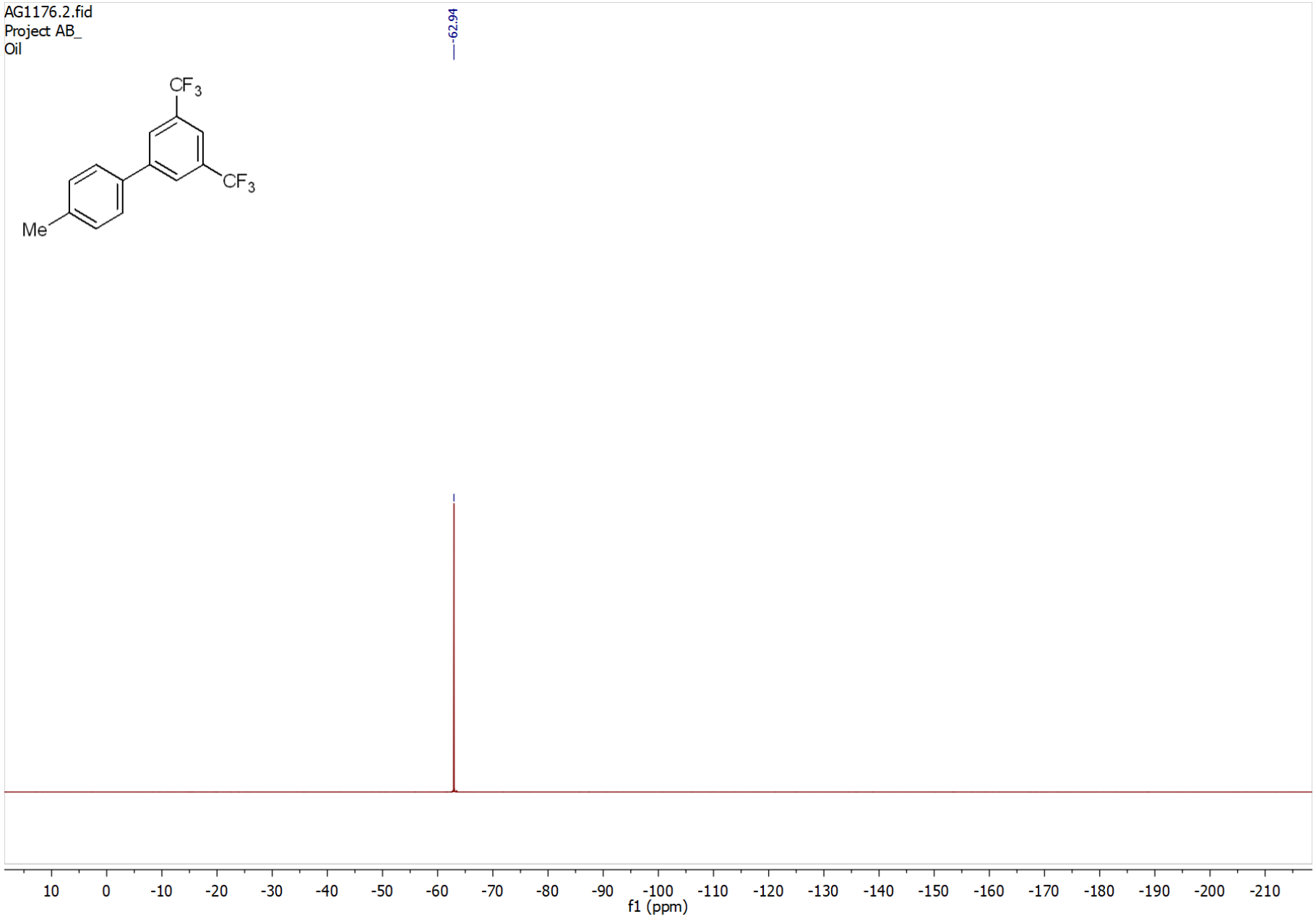
[66] K. T. Neumann, S. Klimczyk, M. N. Burhardt, B. Bang-Andersen, T. Skrydstrup and A. T. Lindhardt, *ACS Catal.*, 2016, **6**, 4710-4714.
[67] K. Itami, T. Nokami, Y. Ishimura, K. Mitsudo, T. Kamei and J.-i. Yoshida, *J. Am. Chem. Soc.*, 2001, **123**, 11577-11585.
[68] A. Ekebergh, R. Begon and N. Kann, *J. Org. Chem.*, 2020, **85**, 2966-2975.

Copies of spectra

Compound 3a



Compound 3a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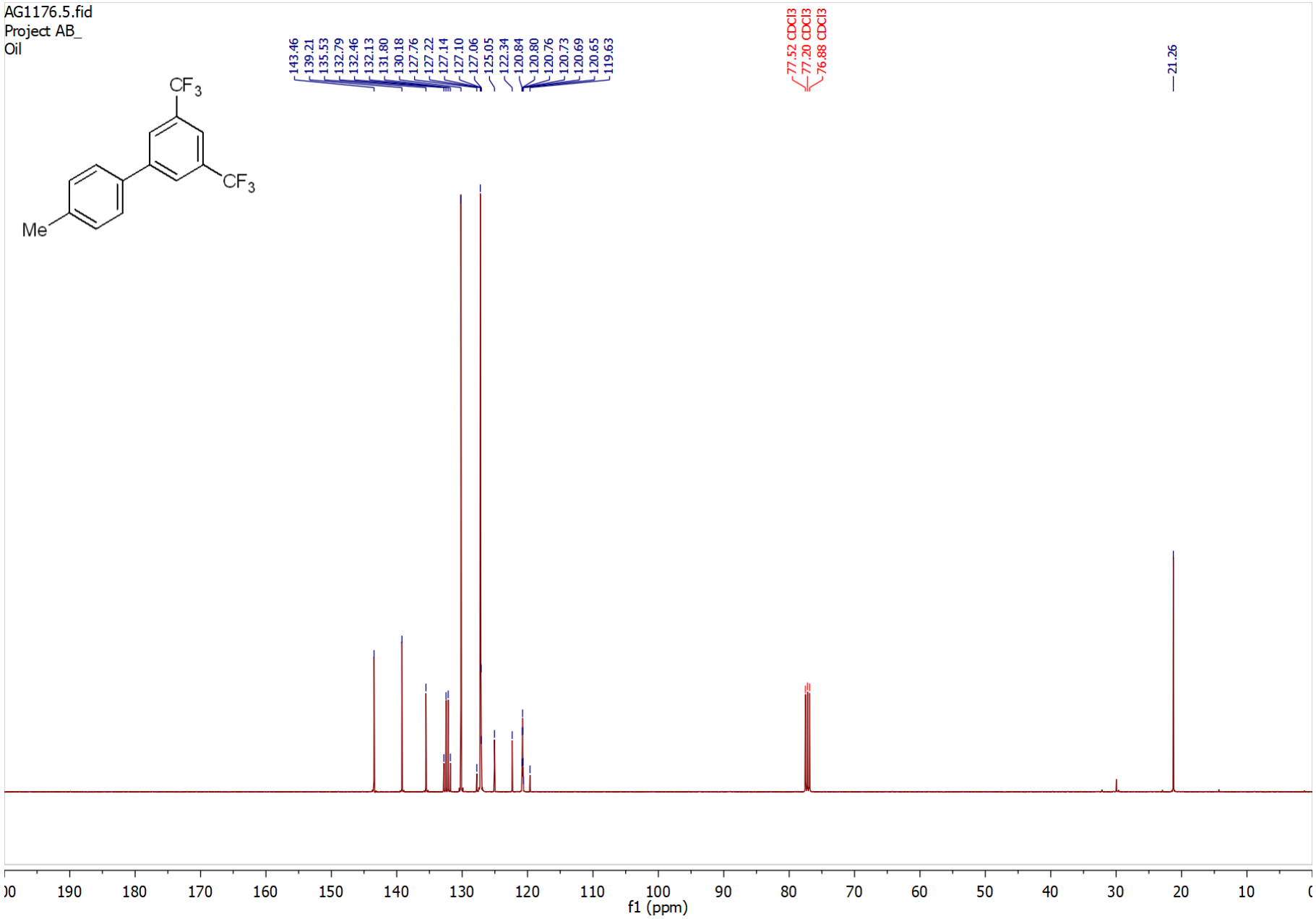
f1 (ppm)

Compound 3a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127.14
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127.06
125.05
122.34
120.84
120.80
120.76
120.73
120.69
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76.88 CDCl3
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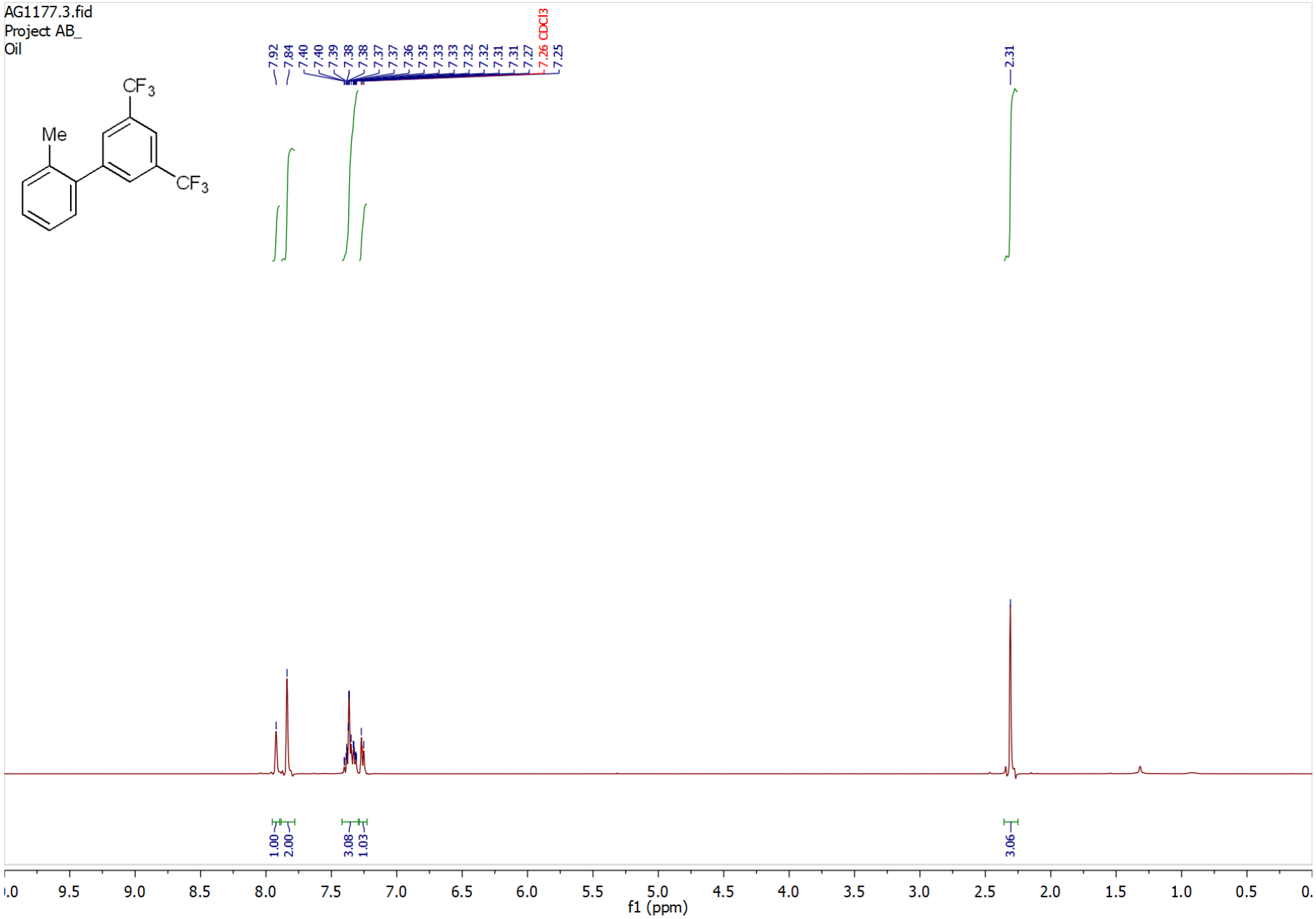
CF3
CF3
Me
f1 (ppm)

Compound 3b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7.35
7.33
7.33
7.32
7.32
7.31
7.31
7.27
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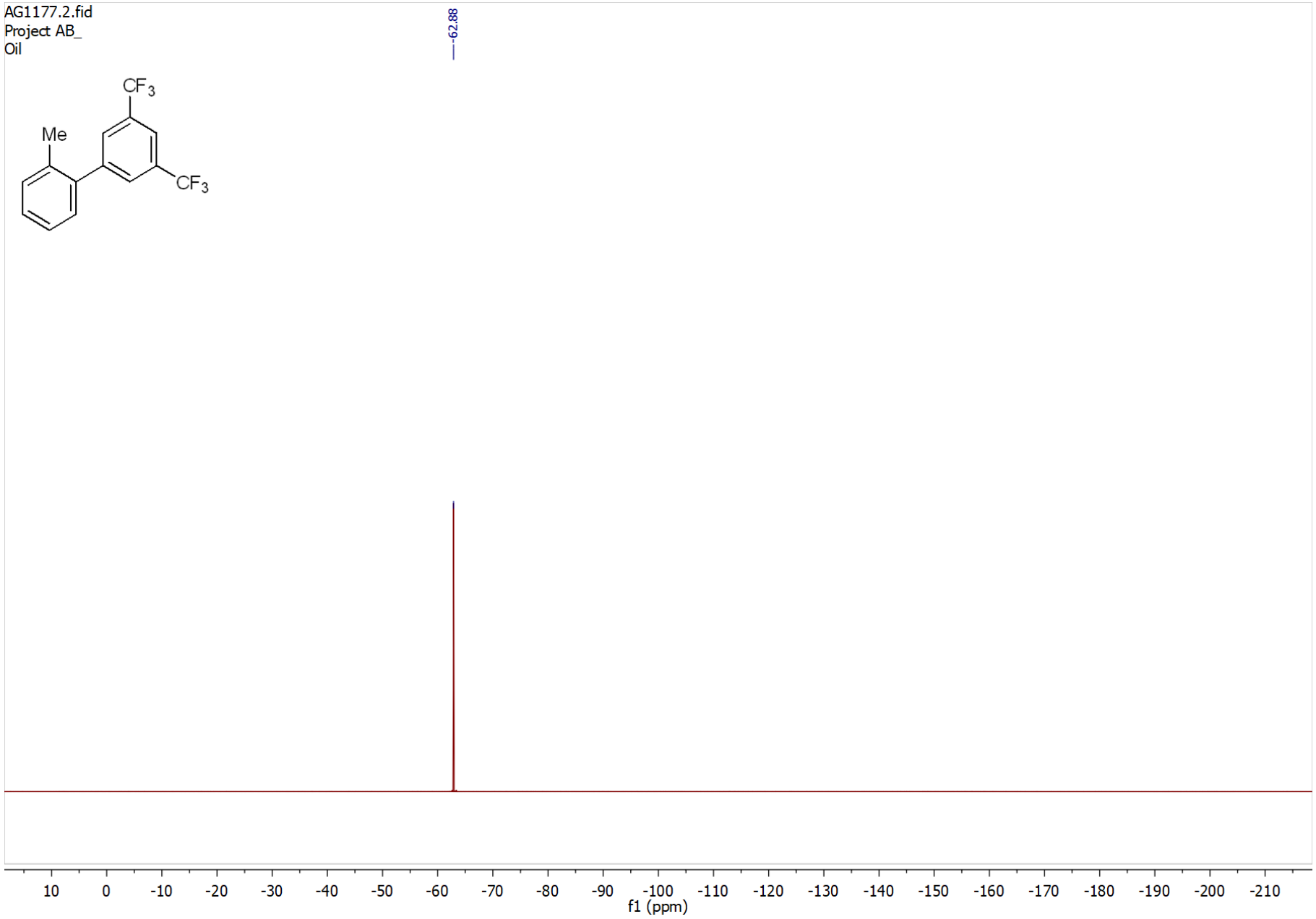
f1 (ppm)

Compound 3b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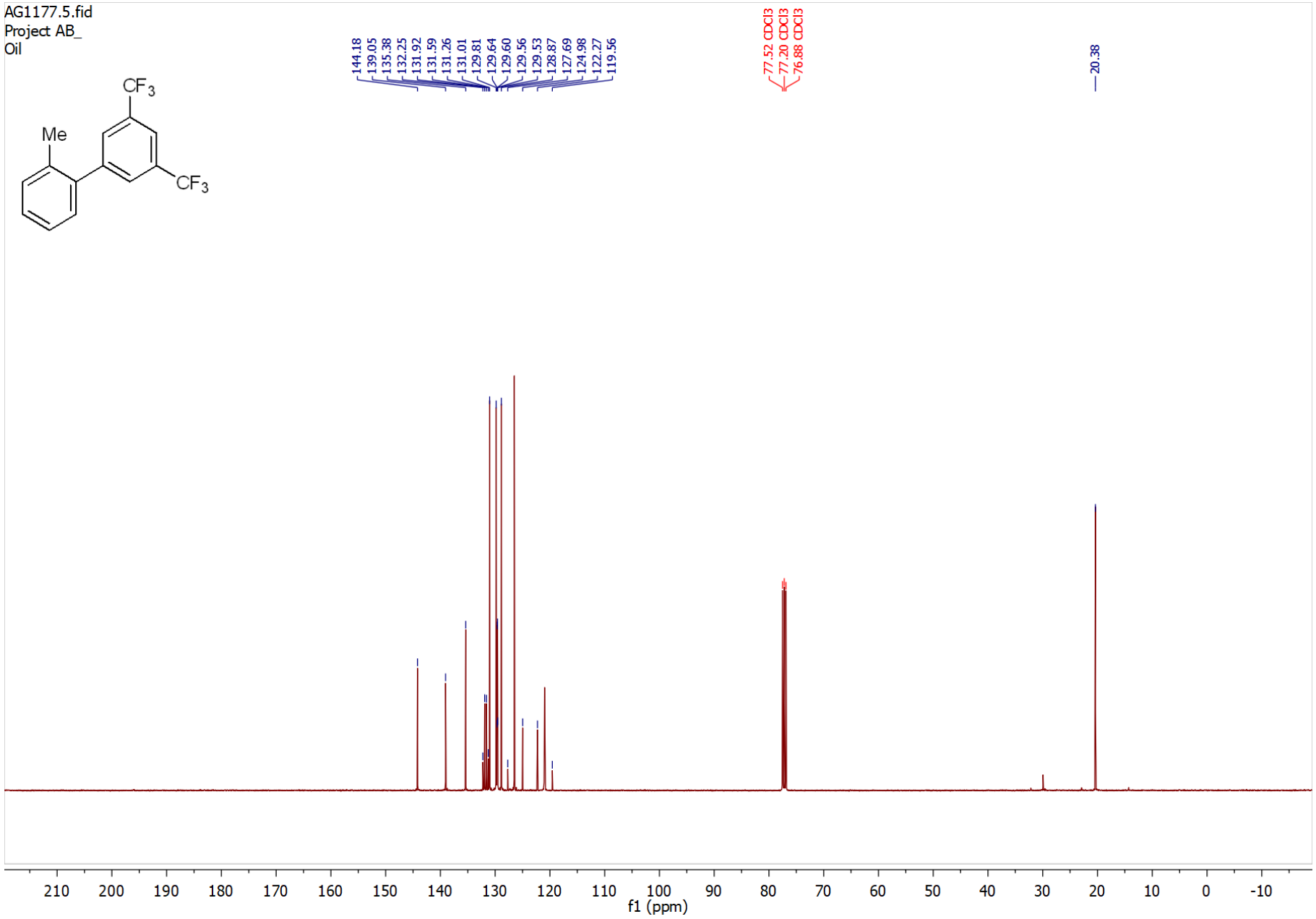
f1 (ppm)

Compound 3b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CF3
Me
CF3
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190
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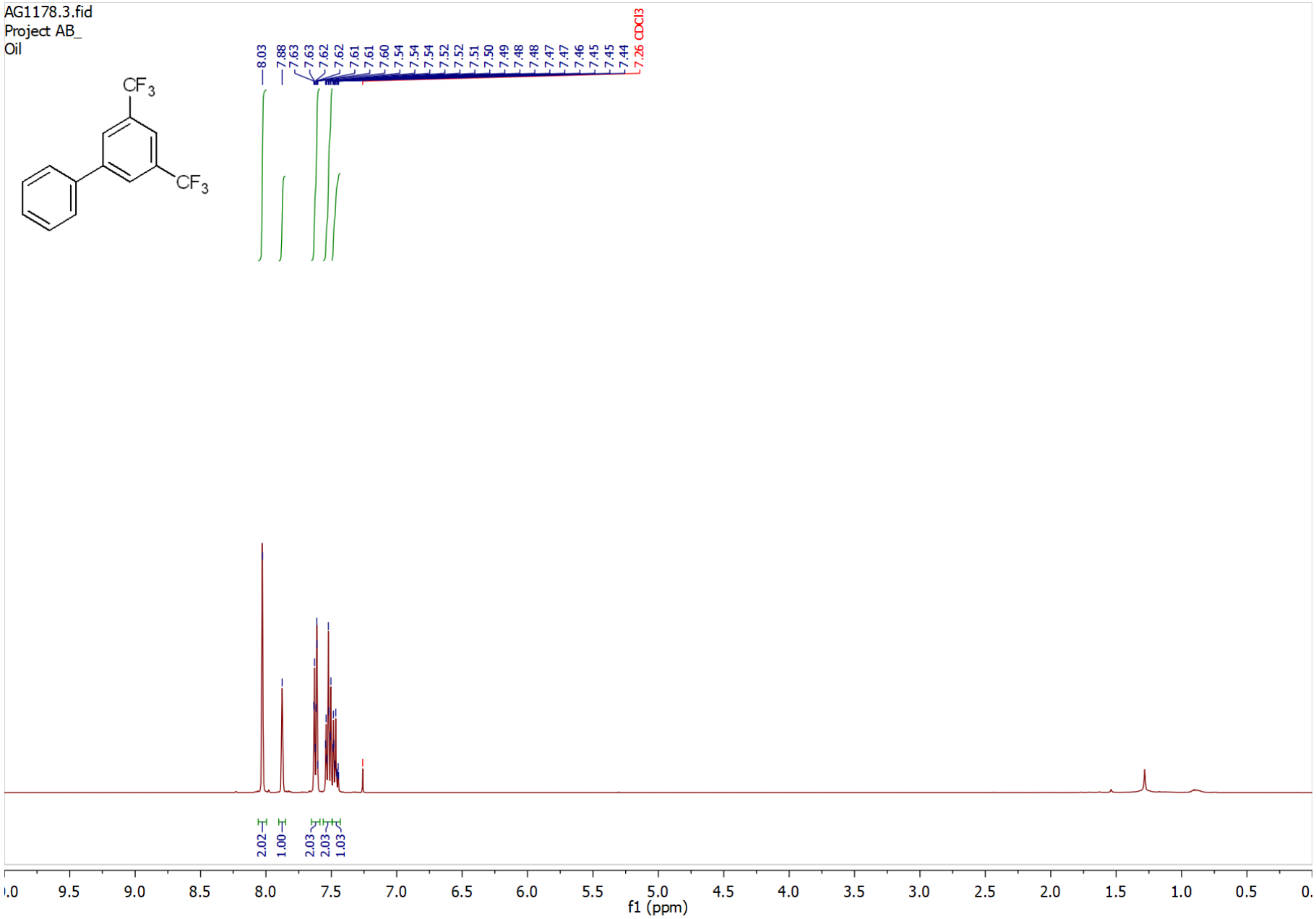
f1 (ppm)

Compound 3c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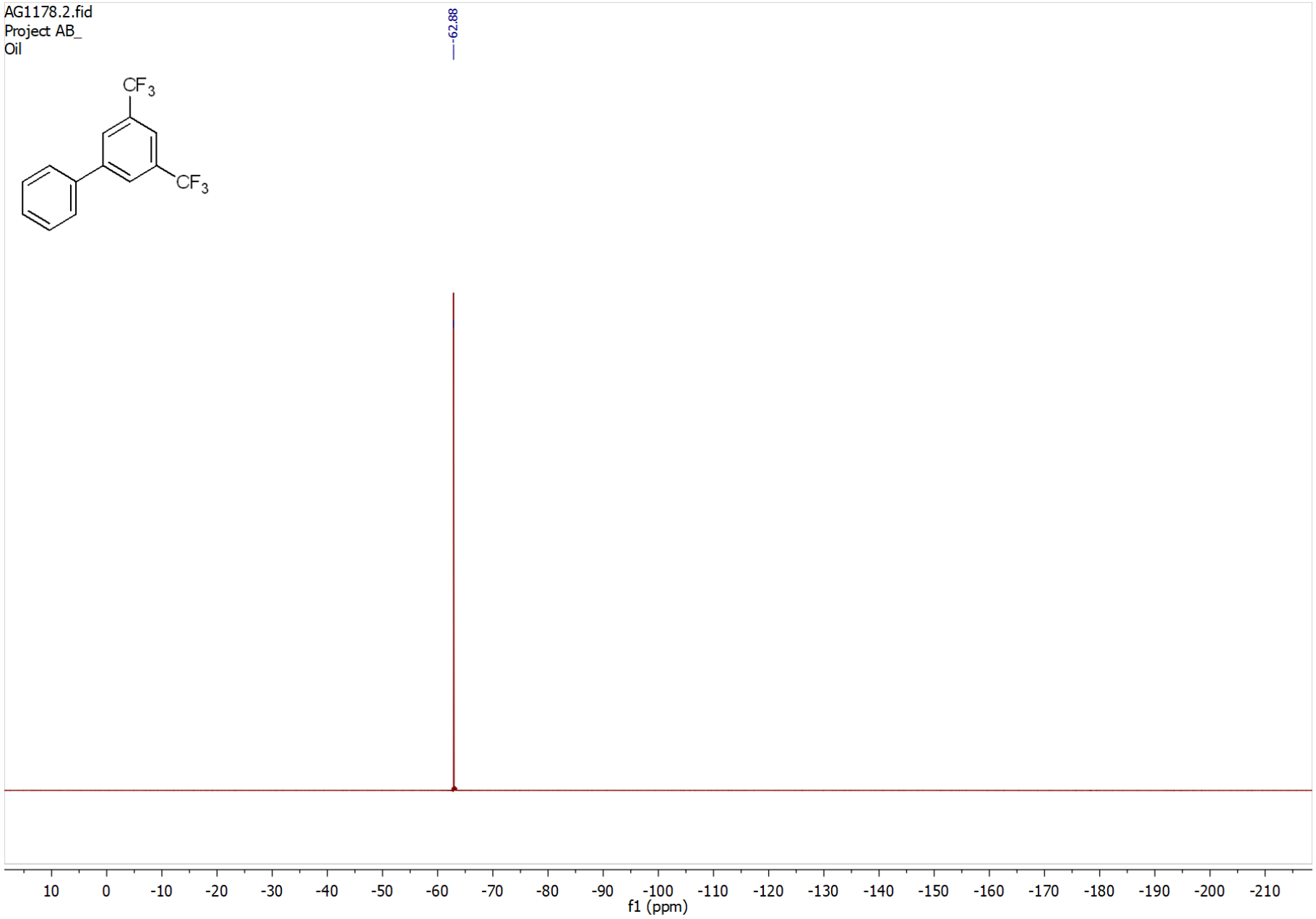
f1 (ppm)

Compound 3c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CF3
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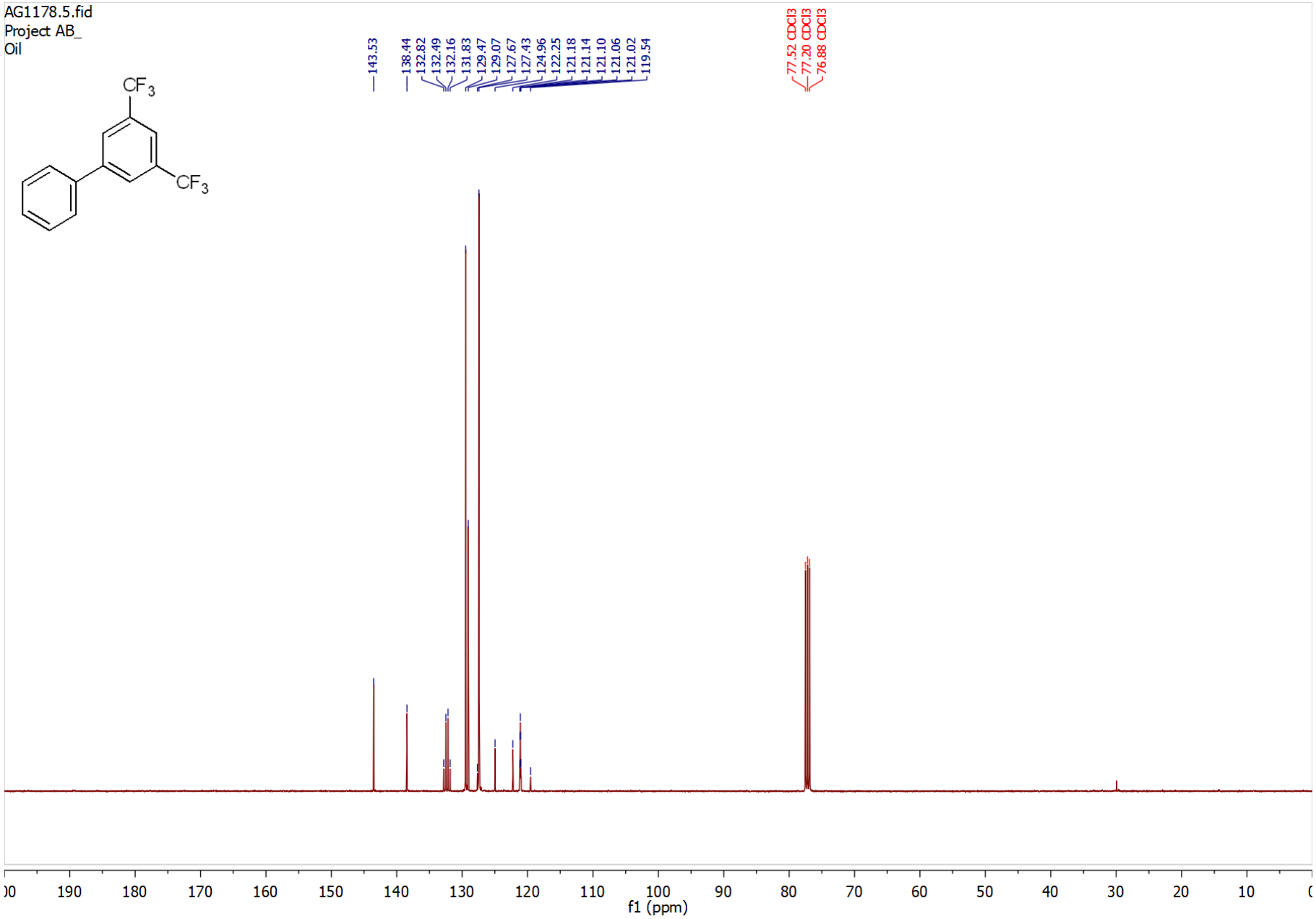
f1 (ppm)

Compound 3c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121.18
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121.06
121.02
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77.20 CDCl3
76.88 CDCl3
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60
50
40
30
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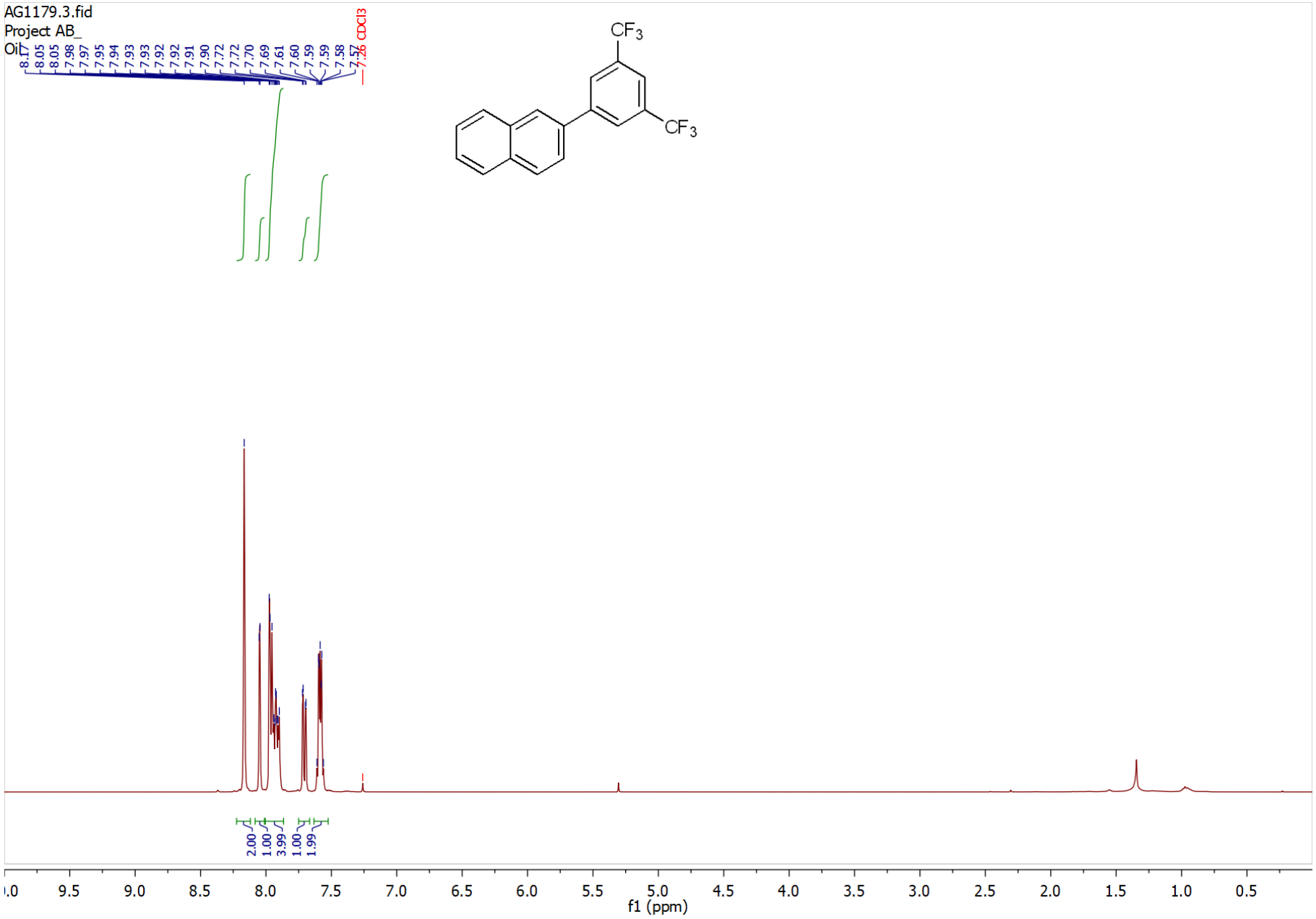
10
f1 (ppm)

Compound 3d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7.90
7.72
7.72
7.70
7.69
7.61
7.60
7.59
7.59
7.58
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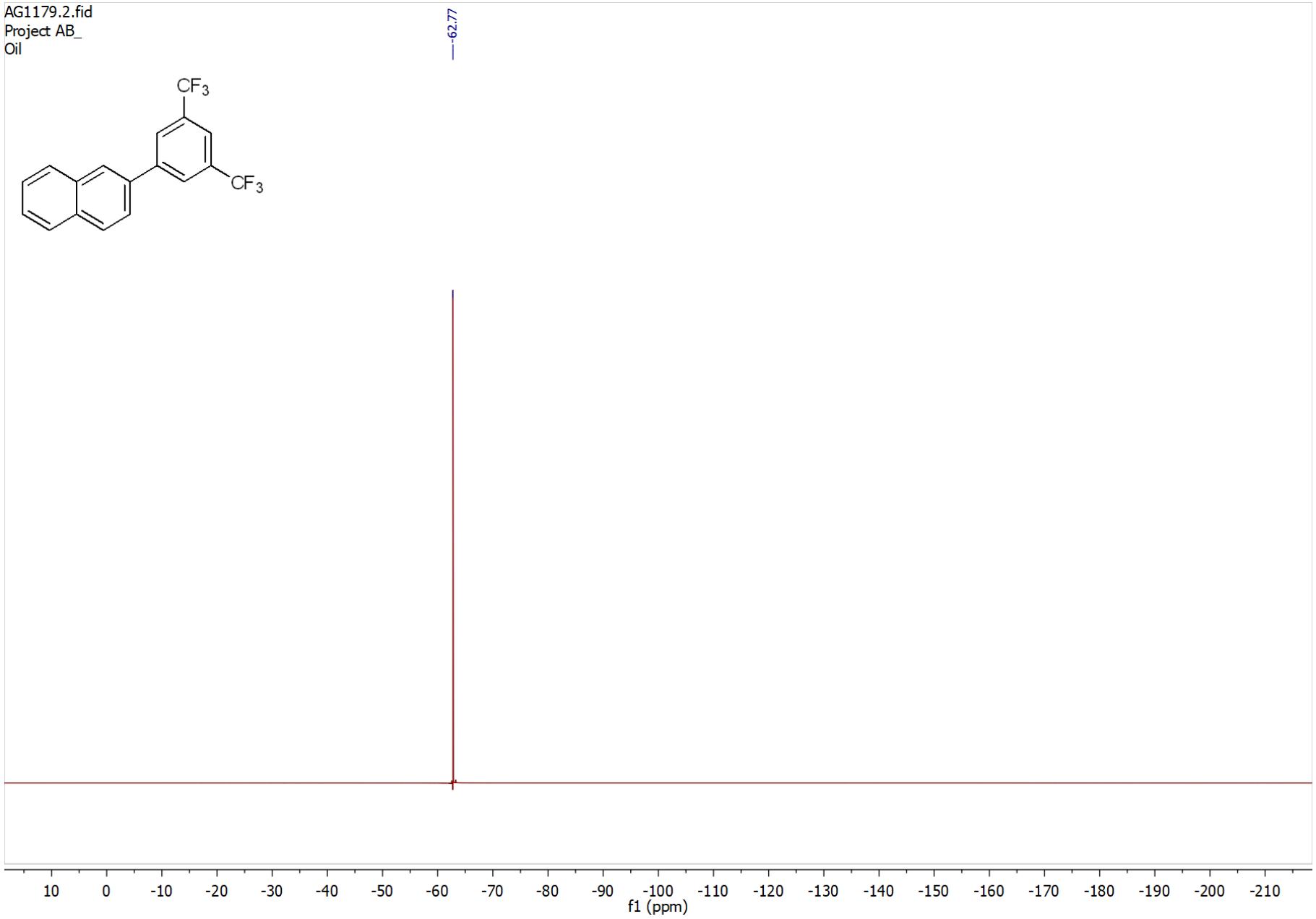
1.00
1.99
f1 (ppm)

Compound 3d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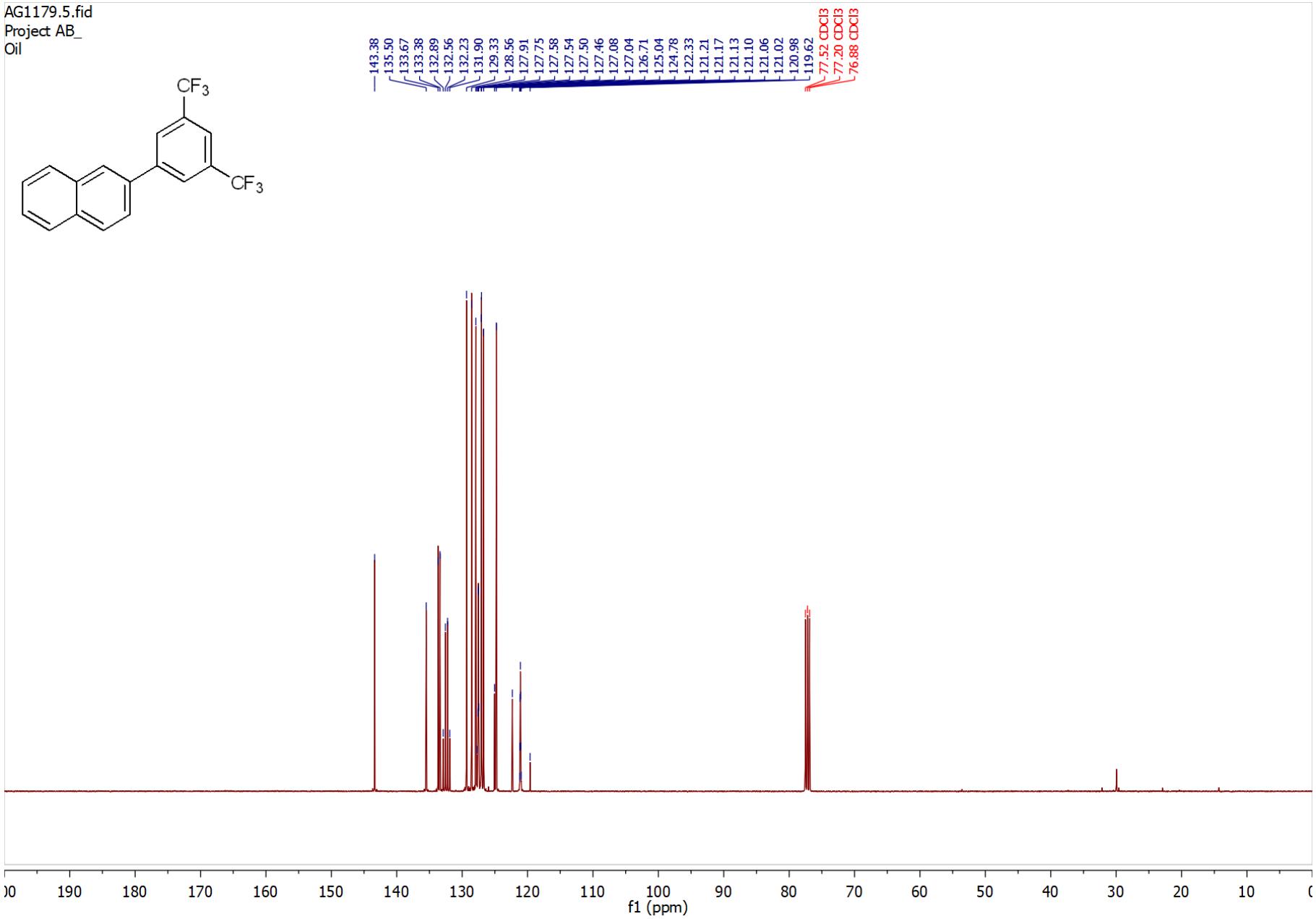
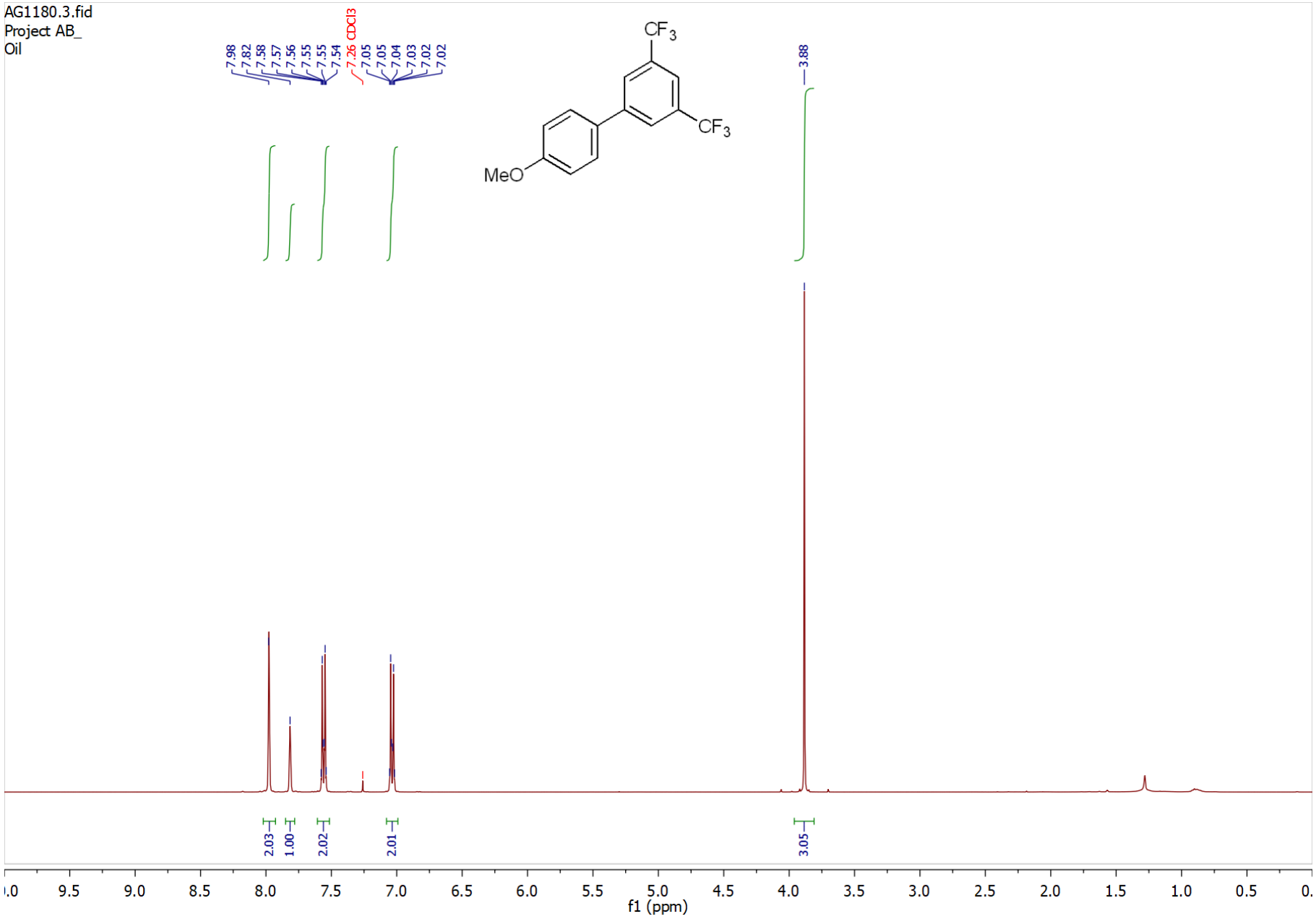
f1 (ppm)

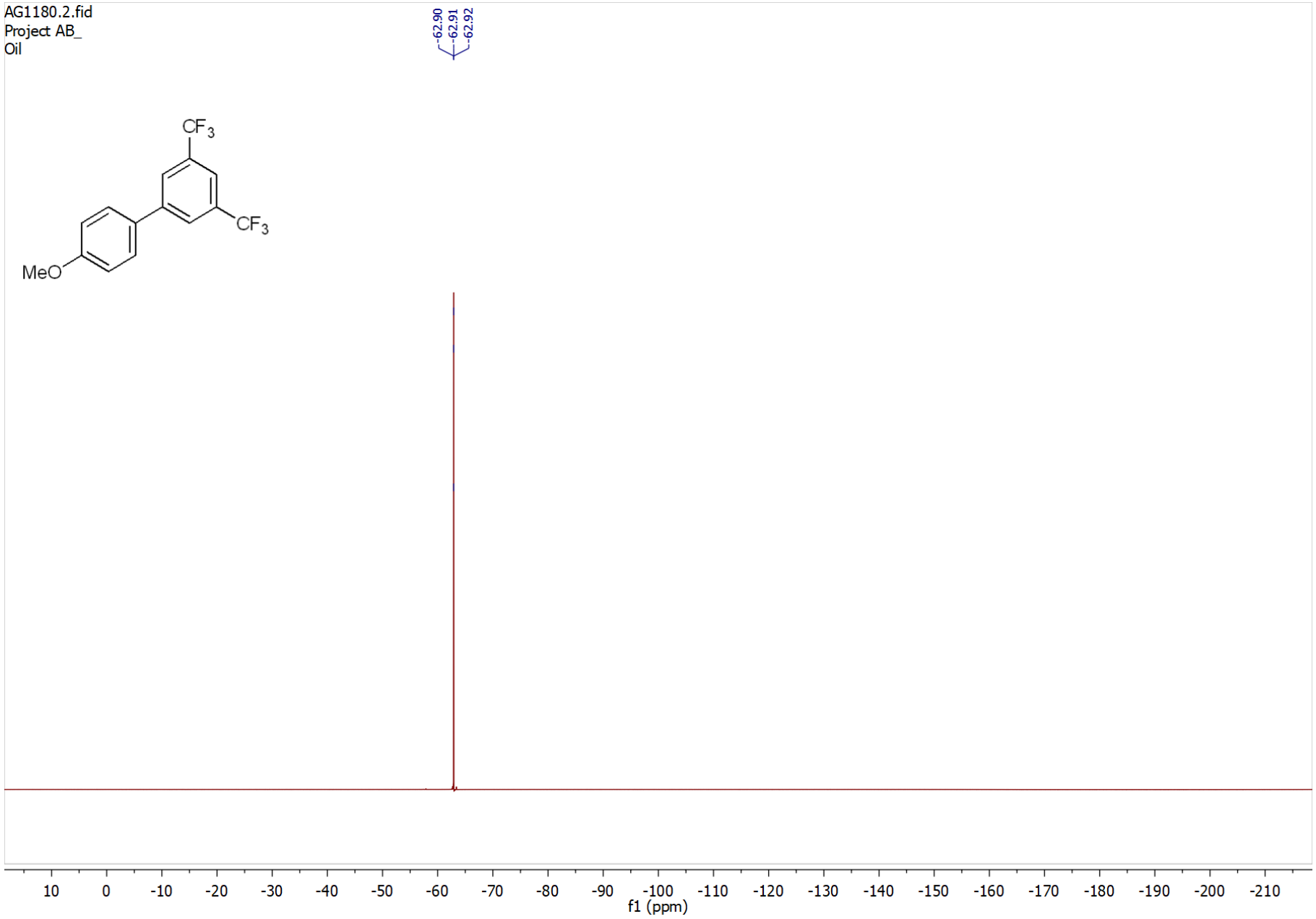
Compound 3d


AG1179.5.fid
Project AB_
Oil
CF3
CF3
143.38
135.50
133.67
133.38
132.89
132.56
132.23
131.90
129.33
128.56
127.91
127.75
127.58
127.54
127.50
127.46
127.08
127.04
126.71
125.04
124.78
122.33
121.21
121.17
121.13
121.10
121.06
121.02
120.98
119.62
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

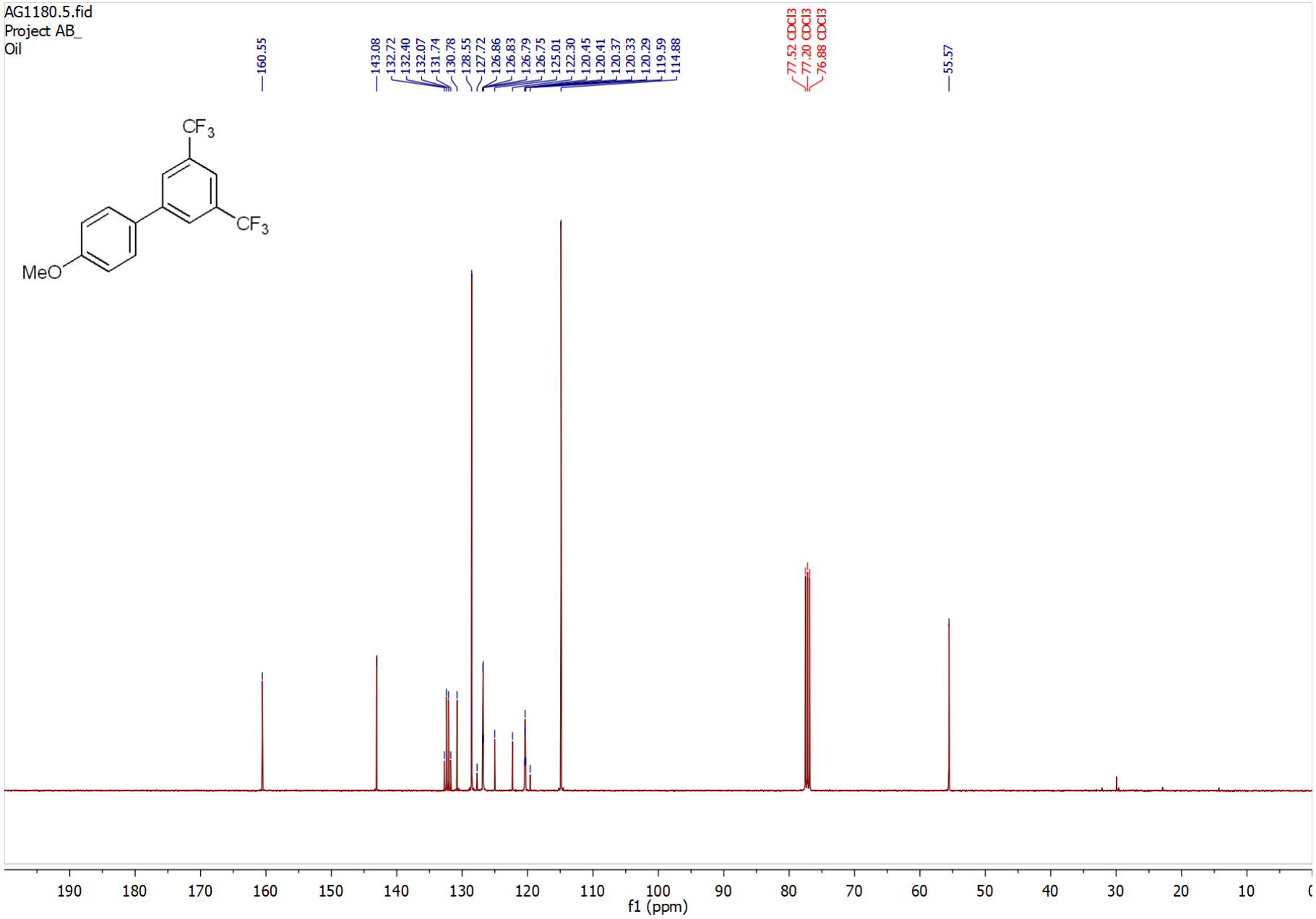
Compound 3e


AG1180.3.fid
Project AB_
Oil
7.98
7.82
7.58
7.57
7.56
7.55
7.55
7.54
7.26 CDCl3
7.05
7.05
7.04
7.03
7.02
7.02
3.88
CF3
CF3
MeO
2.03
1.00
2.02
2.01
3.05
f1 (ppm)

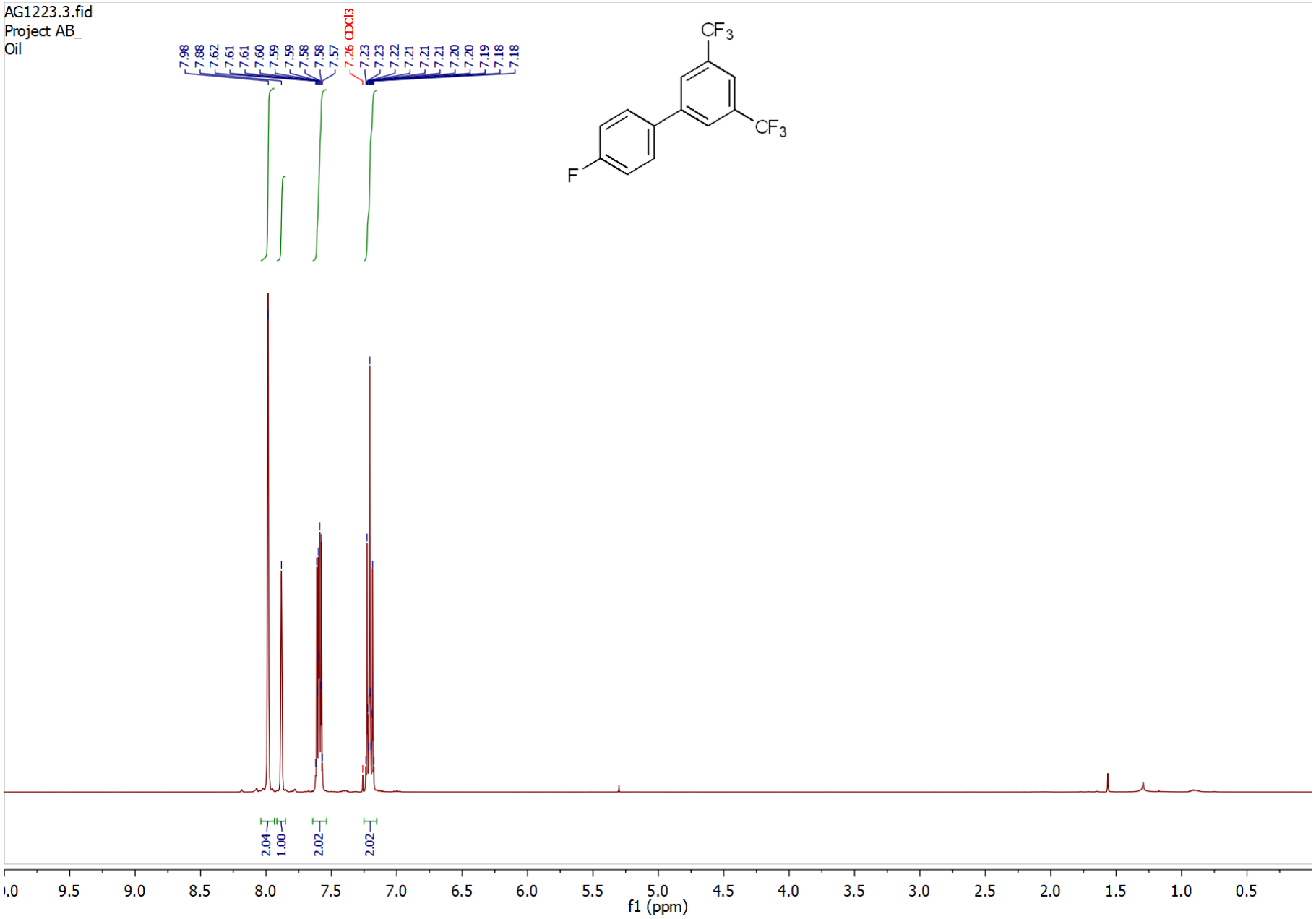
Compound 3e


AG1180.2.fid
Project AB_
Oil
-62.90
-62.91
-62.92
CF3
CF3
MeO
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

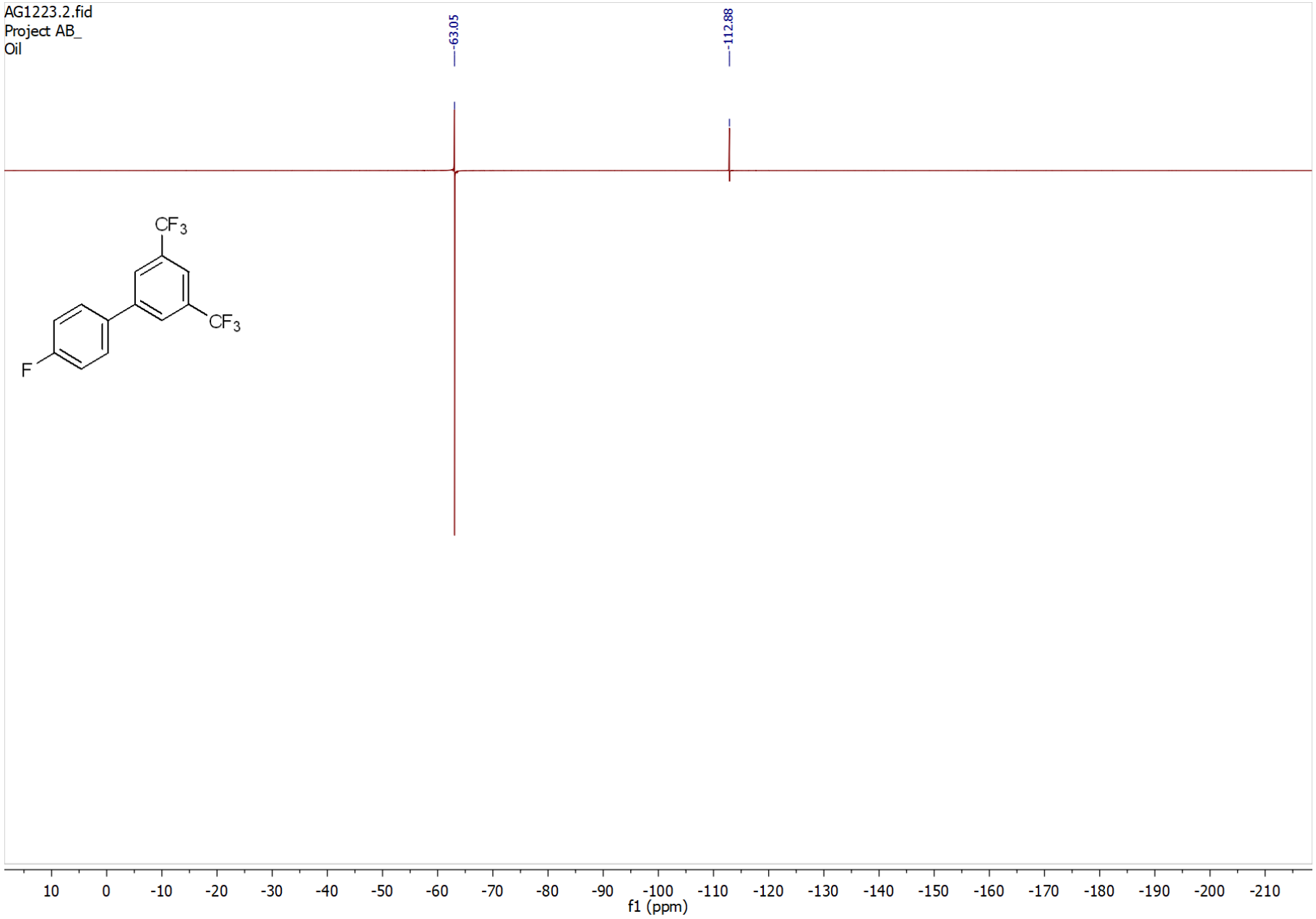
Compound 3e


AG1180.5.fid
Project AB_
Oil
160.55
143.08
132.72
132.40
132.07
131.74
130.78
128.55
127.72
126.86
126.83
126.79
126.75
125.01
122.30
120.45
120.41
120.37
120.33
120.29
119.59
114.88
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.57
CF3
CF3
MeO
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

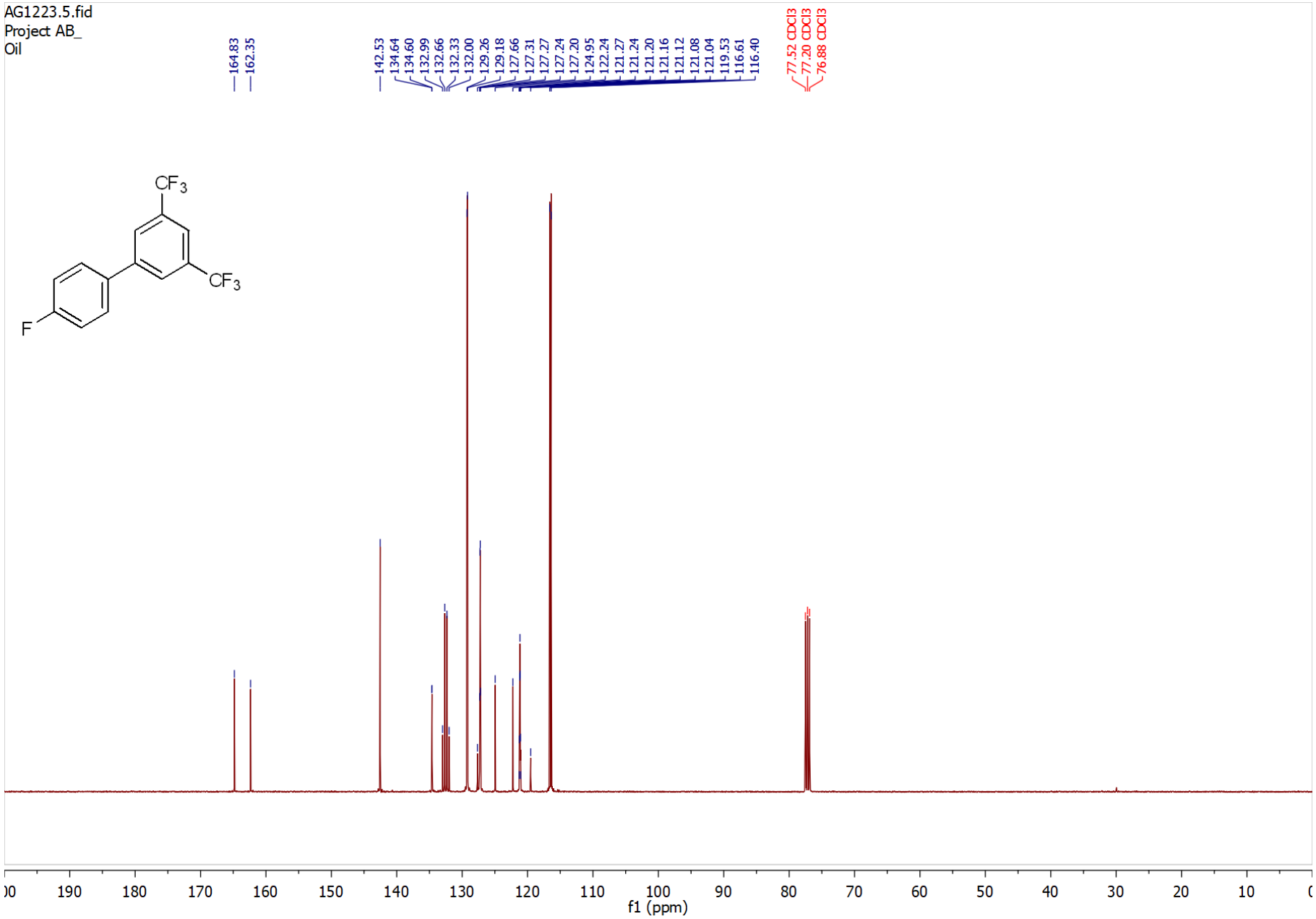
Compound 3f


AG1223.3.fid
Project AB_
Oil
7.98
7.88
7.62
7.61
7.61
7.60
7.59
7.59
7.58
7.58
7.57
7.26 CDCl3
7.23
7.23
7.22
7.21
7.21
7.21
7.20
7.20
7.19
7.18
7.18
CF3
CF3
F
2.04
1.00
2.02
2.02
f1 (ppm)

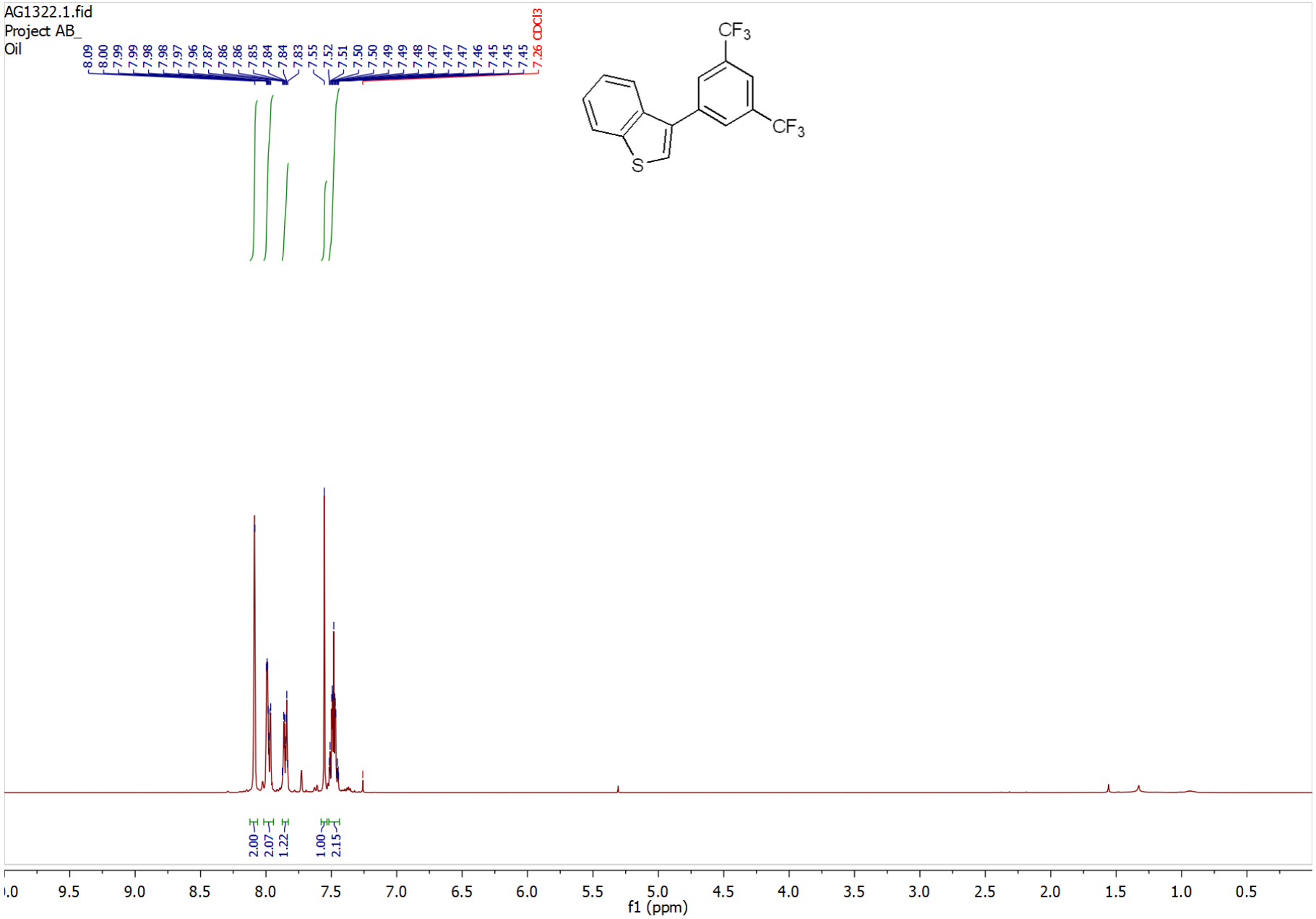
Compound 3f


AG1223.2.fid
Project AB_
Oil
-63.05
-112.88
CF3
CF3
F
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

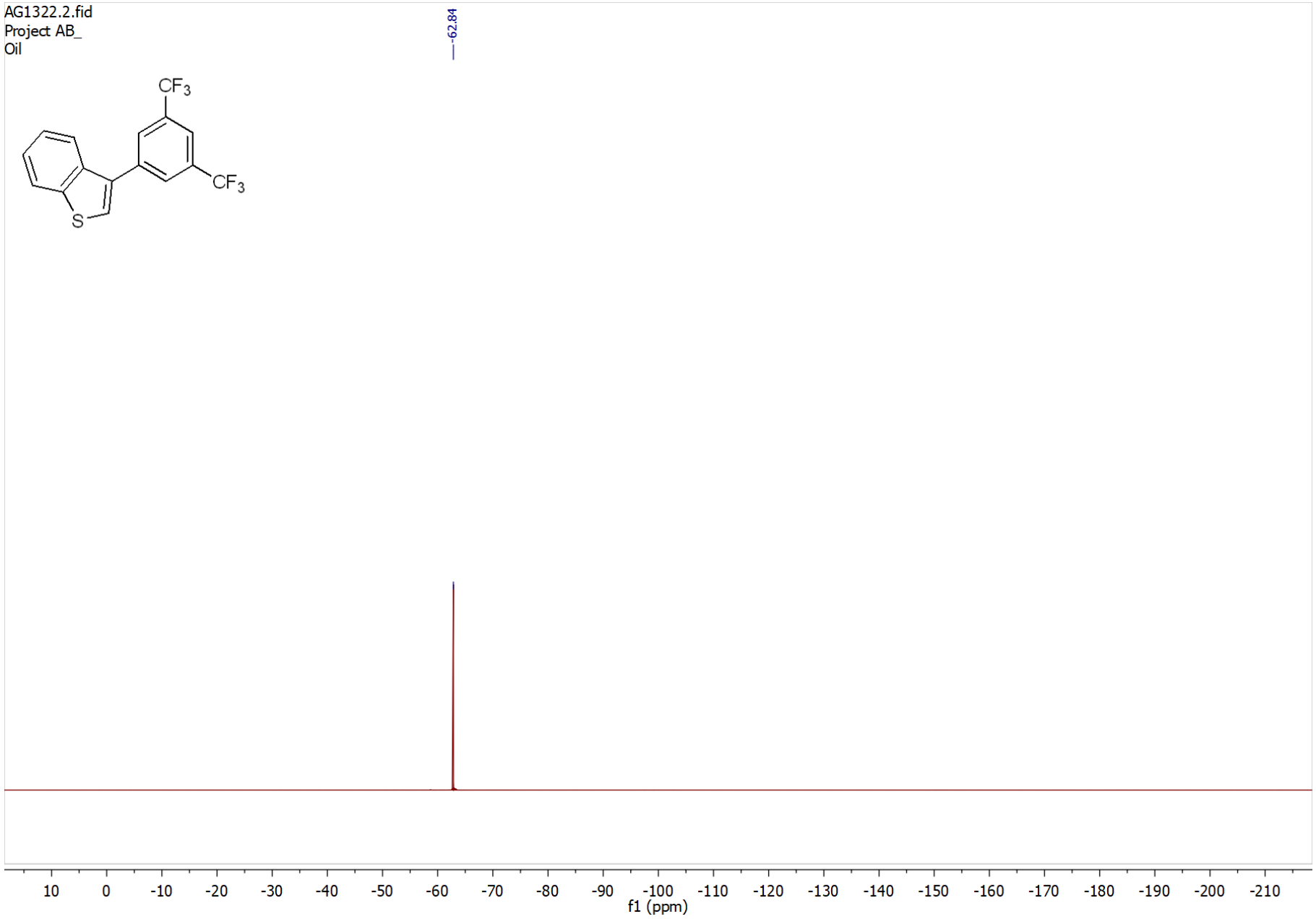
Compound 3f


AG1223.5.fid
Project AB_
Oil
164.83
162.35
142.53
134.64
134.60
132.99
132.66
132.33
132.00
129.26
129.18
127.66
127.31
127.27
127.24
127.20
124.95
122.24
121.27
121.24
121.20
121.16
121.12
121.08
121.04
119.53
116.61
116.40
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
F
f1 (ppm)

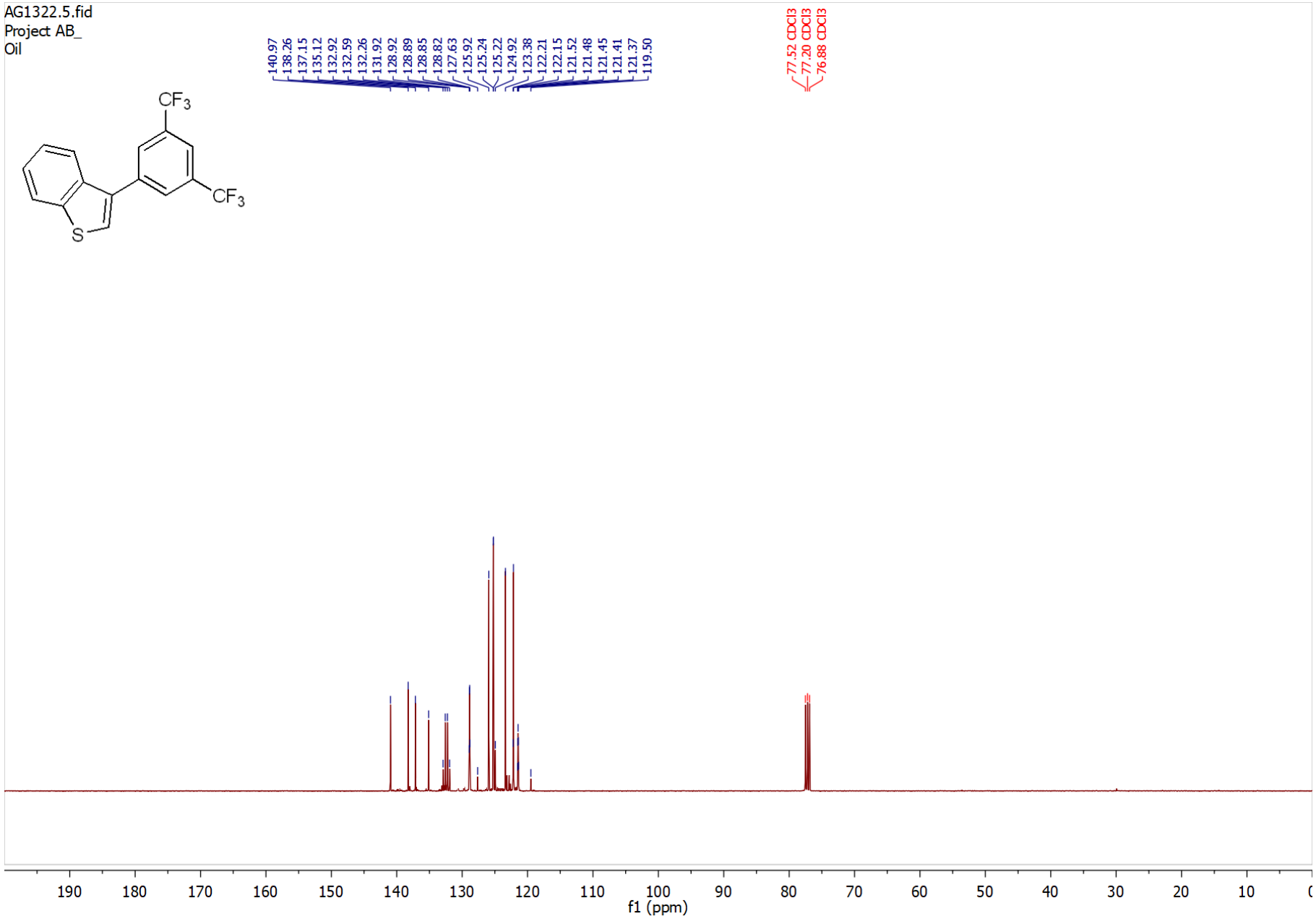
Compound 3g


AG1322.1.fid
Project AB_
Oil
8.09 8.00 7.99 7.99 7.98 7.98 7.97 7.96 7.87 7.86 7.86 7.85 7.84 7.84 7.83 7.55 7.52 7.51 7.50 7.50 7.49 7.49 7.48 7.47 7.47 7.47 7.46 7.45 7.45 7.45 7.26 CDCl3
CF3
CF3
S
2.00 2.07 1.22 1.00 2.15
f1 (ppm)

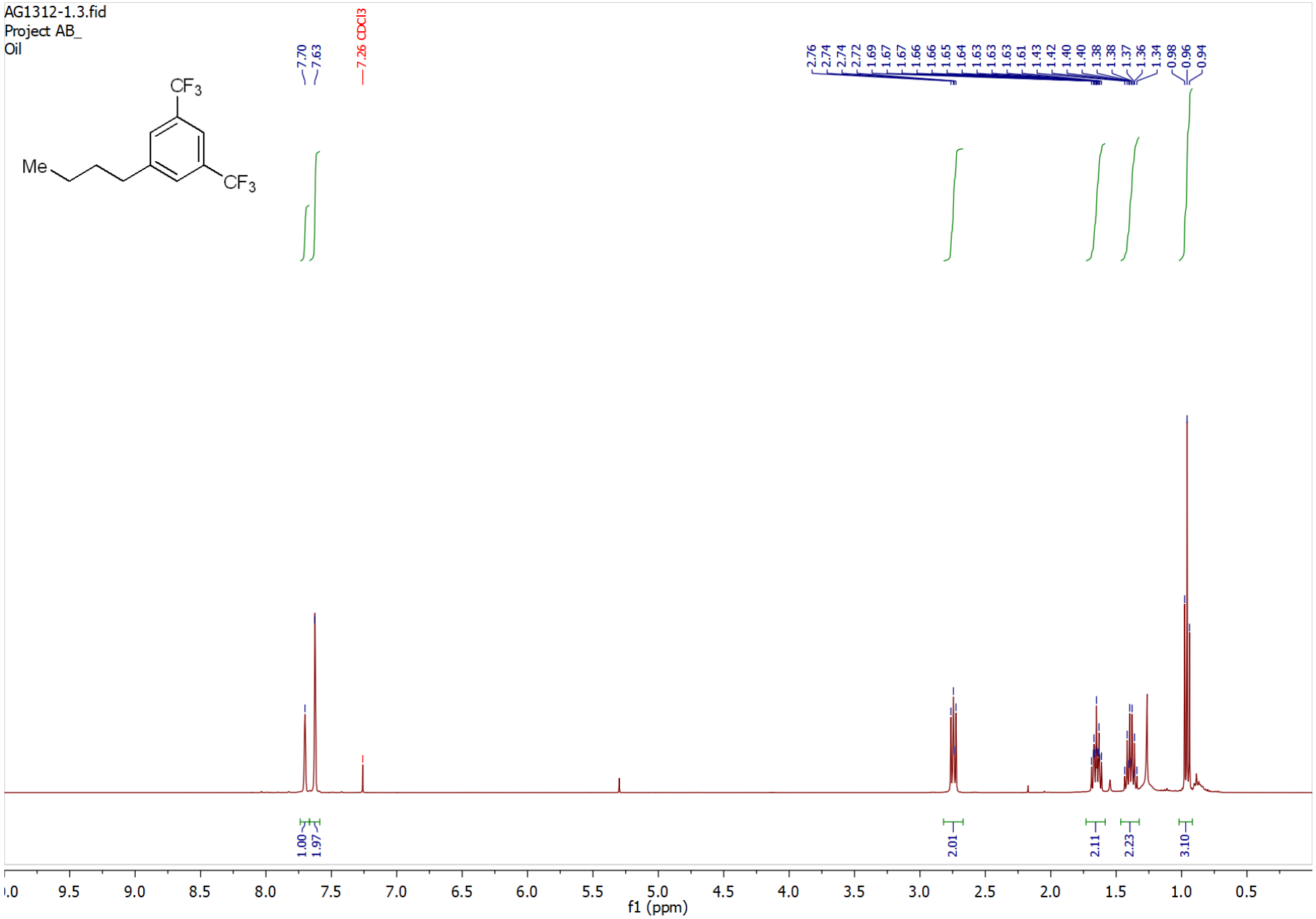
Compound 3g


AG1322.2.fid
Project AB_
Oil
-62.84
CF3
CF3
S
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

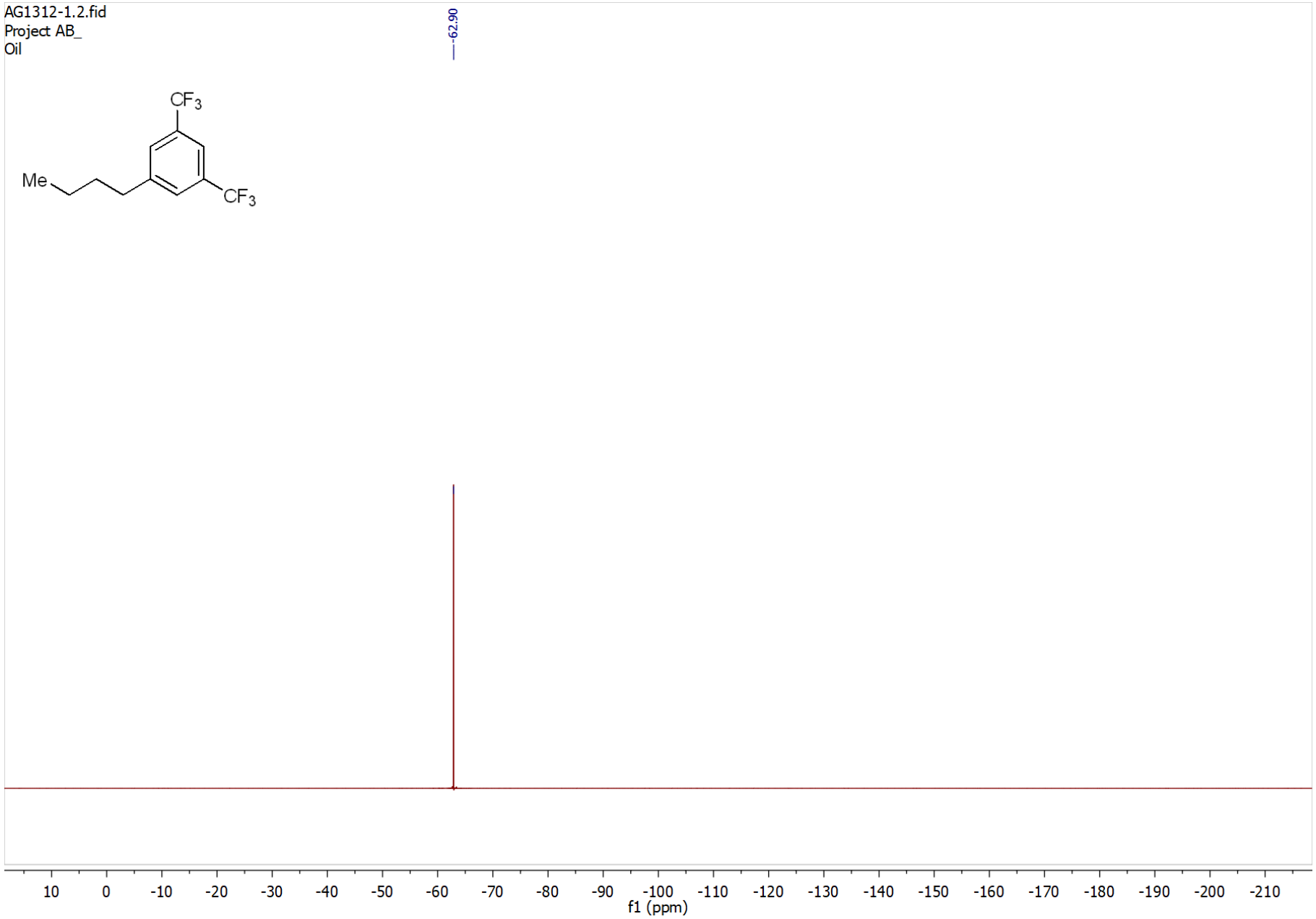
Compound 3g


AG1322.5.fid
Project AB_
Oil
140.97
138.26
137.15
135.12
132.92
132.59
132.26
131.92
128.92
128.89
128.85
128.82
127.63
125.92
125.24
125.22
124.92
123.38
122.21
122.15
121.52
121.48
121.45
121.41
121.37
119.50
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
S
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

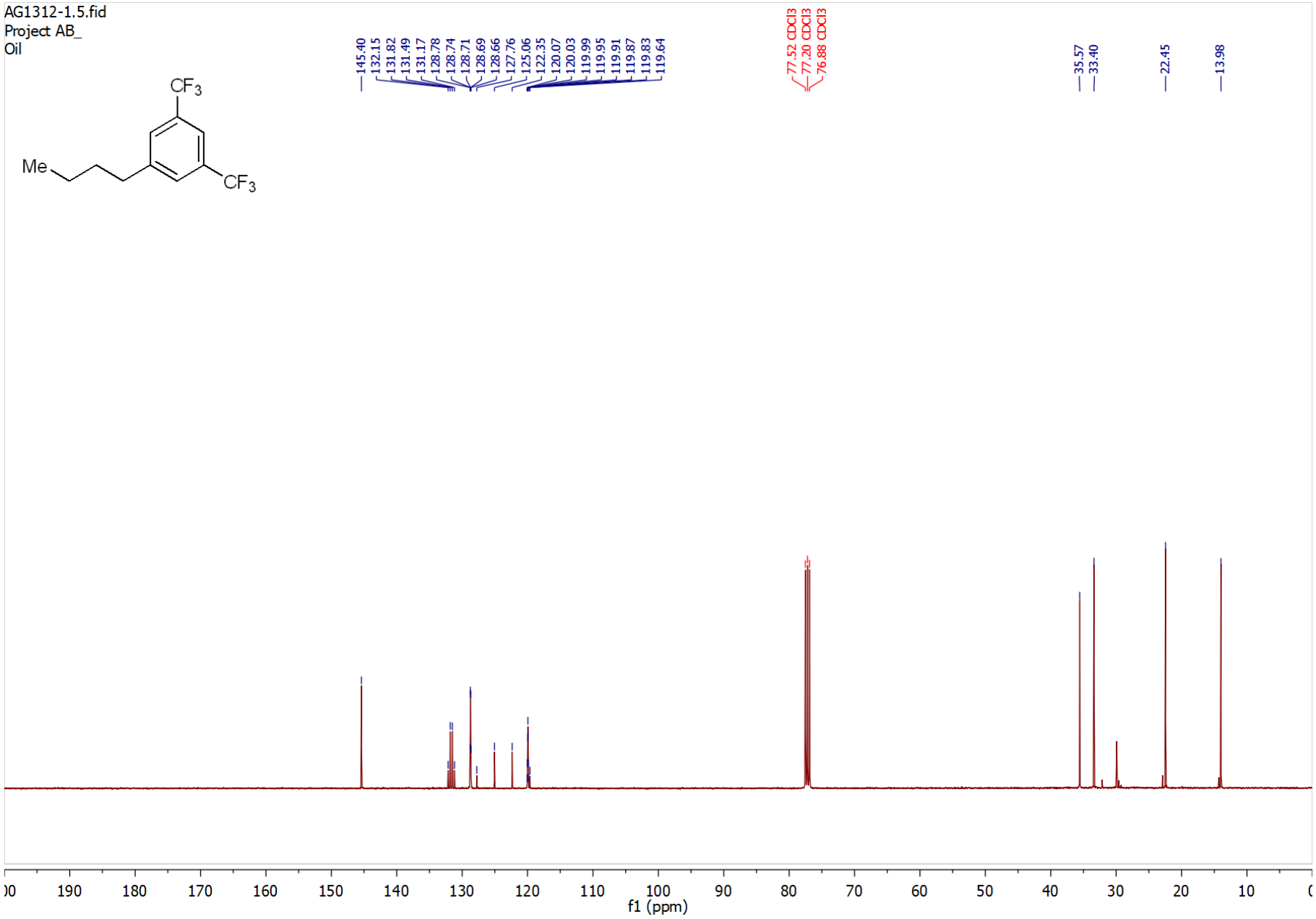
Compound 3h


AG1312-1.3.fid
Project AB_
Oil
CF3
Me
CF3
7.70
7.63
7.26 CDCl3
2.76
2.74
2.74
2.72
1.69
1.67
1.67
1.66
1.66
1.65
1.64
1.63
1.63
1.63
1.61
1.43
1.42
1.40
1.40
1.38
1.37
1.36
1.34
0.98
0.96
0.94
1.00
1.97
2.01
2.11
2.23
3.10
f1 (ppm)

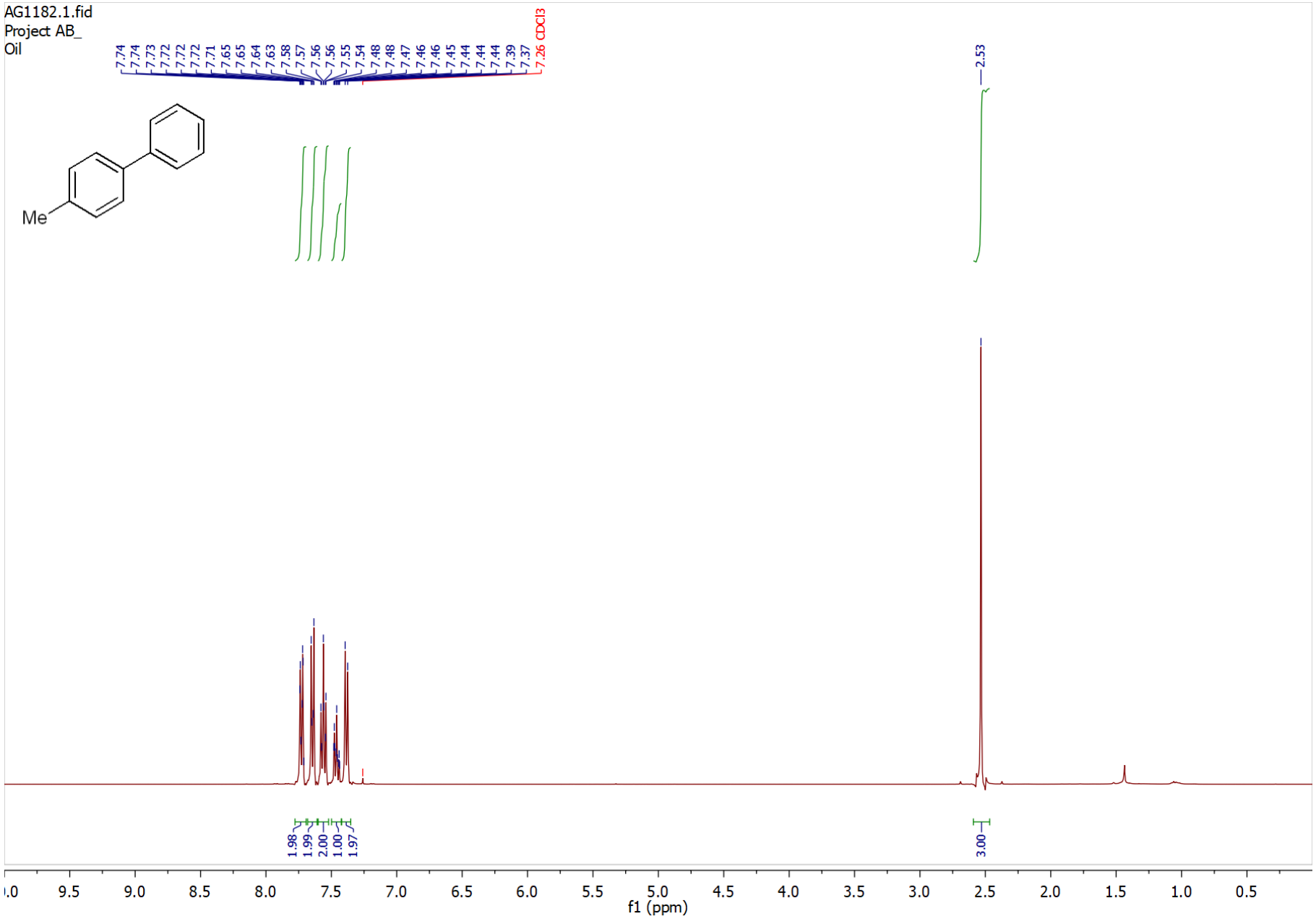
Compound 3h


AG1312-1.2.fid
Project AB_
Oil
62.90
CF3
Me
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

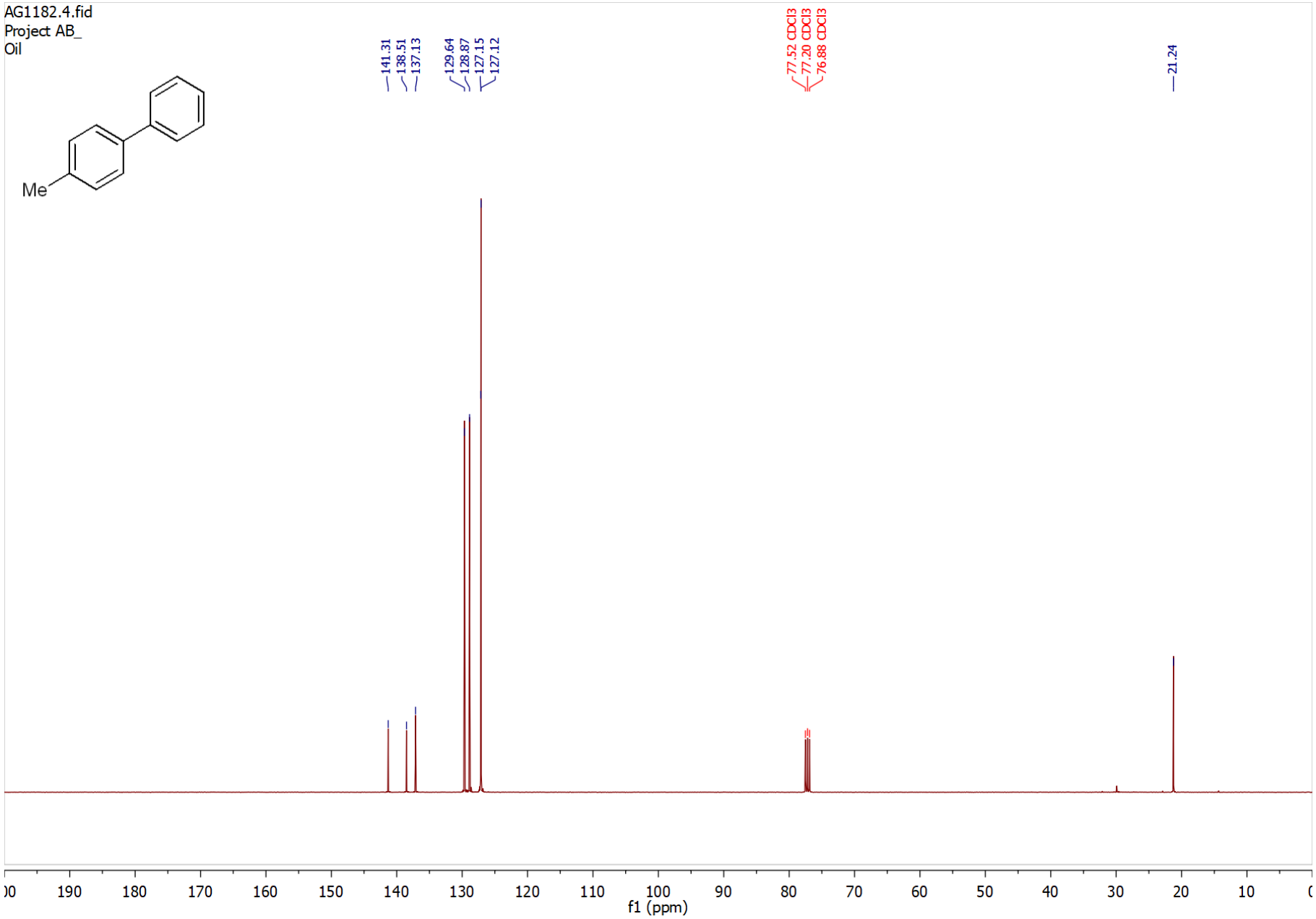
Compound 3h


AG1312-1.5.fid
Project AB_
Oil
CF3
Me
CF3
145.40
132.15
131.82
131.49
131.17
128.78
128.74
128.71
128.69
128.66
127.76
125.06
122.35
120.07
120.03
119.99
119.95
119.91
119.87
119.83
119.64
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
35.57
33.40
22.45
13.98
f1 (ppm)

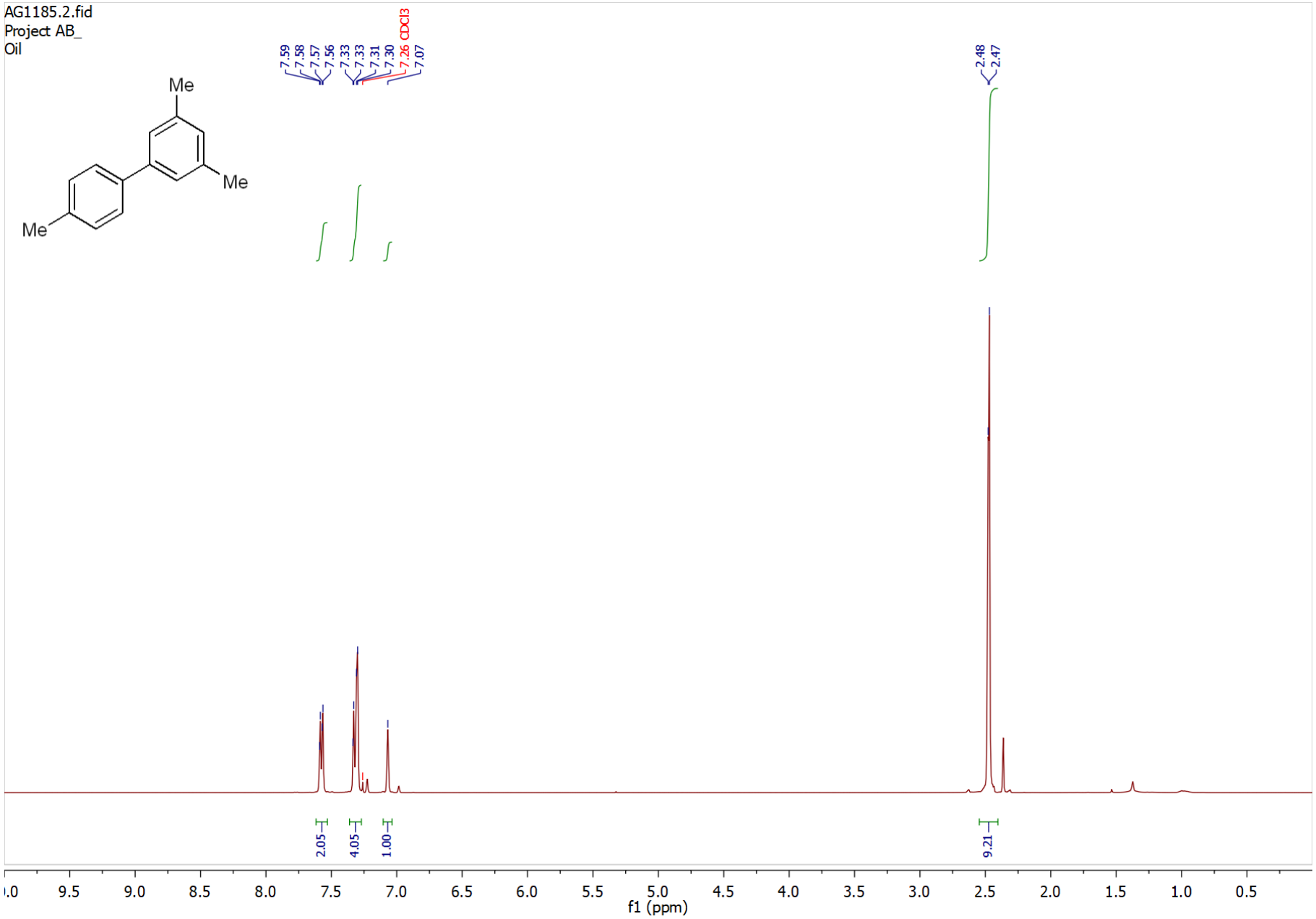
Compound 3i


AG1182.1.fid
Project AB_
Oil
7.74
7.74
7.73
7.72
7.72
7.72
7.71
7.65
7.64
7.63
7.58
7.57
7.56
7.56
7.55
7.54
7.48
7.48
7.47
7.46
7.46
7.45
7.44
7.44
7.44
7.39
7.37
7.26 CDCl3
2.53
Me
1.98
1.99
2.00
1.00
1.97
3.00
f1 (ppm)

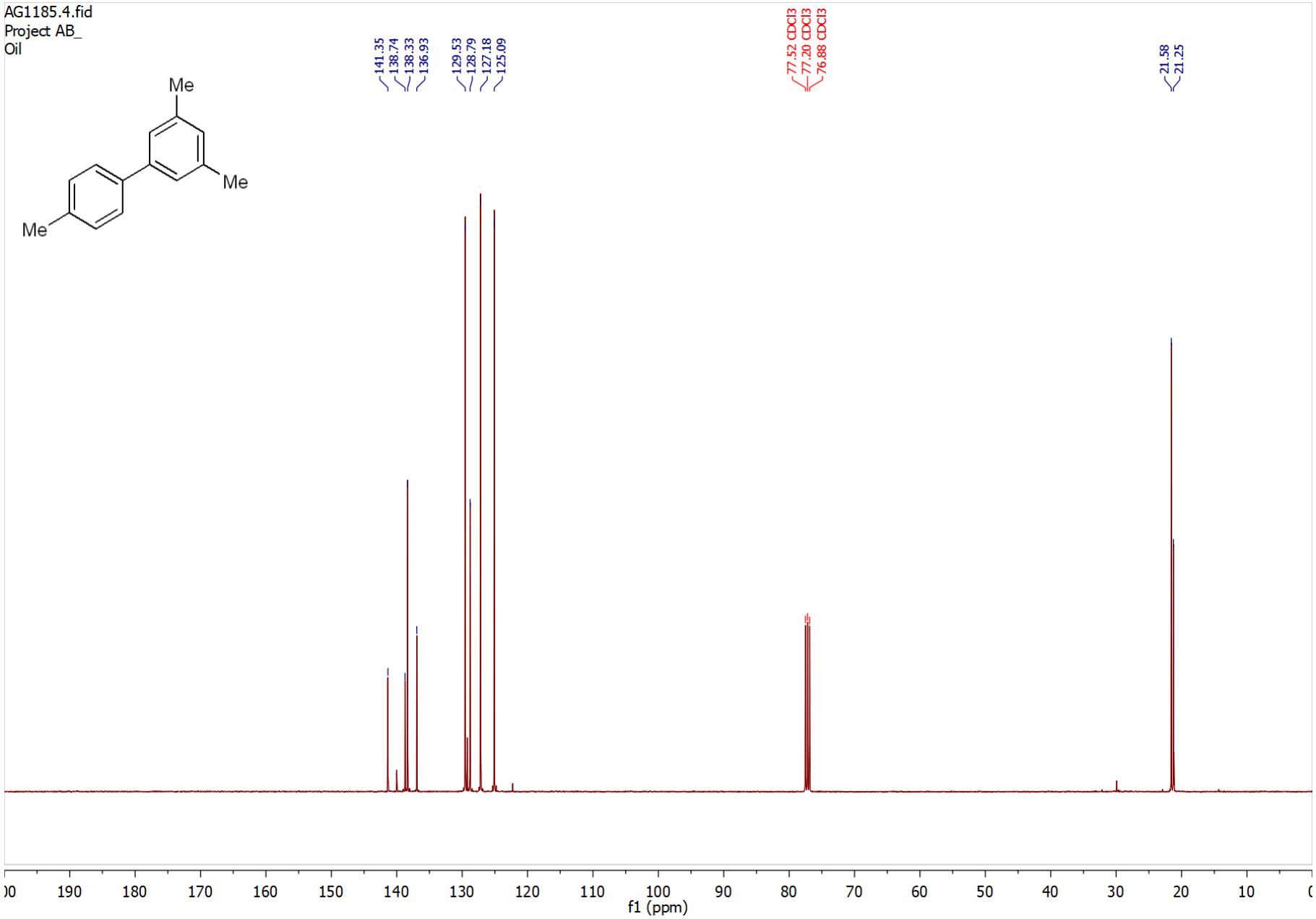
Compound 3i


AG1182.4.fid
Project AB_
Oil
Me
141.31
138.51
137.13
129.64
128.87
127.15
127.12
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.24
f1 (ppm)

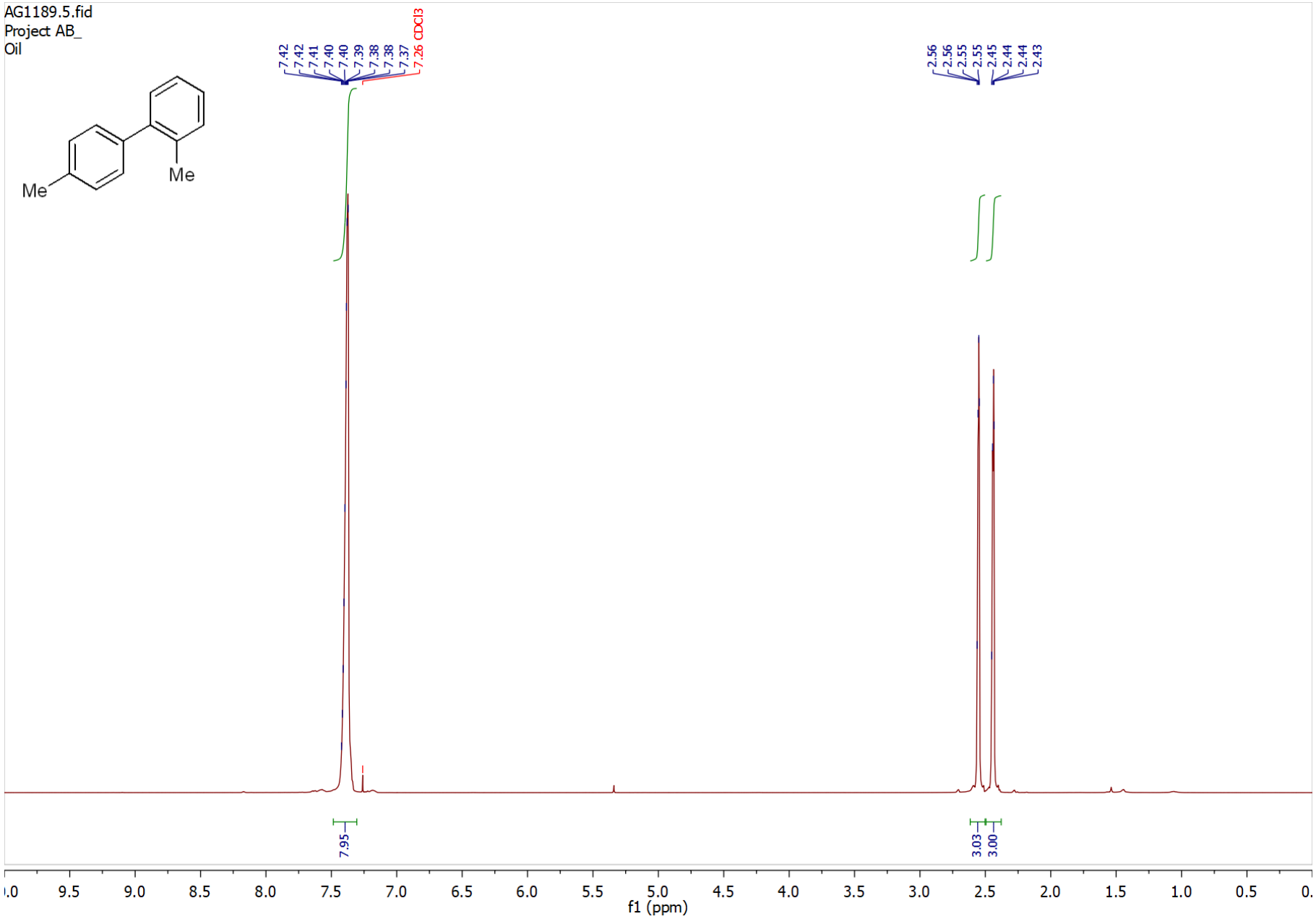
Compound 3j


AG1185.2.fid
Project AB_
Oil
Me
Me
Me
7.59
7.58
7.57
7.56
7.33
7.33
7.31
7.30
7.26 CDCl3
7.07
2.48
2.47
2.05
4.05
1.00
9.21
f1 (ppm)

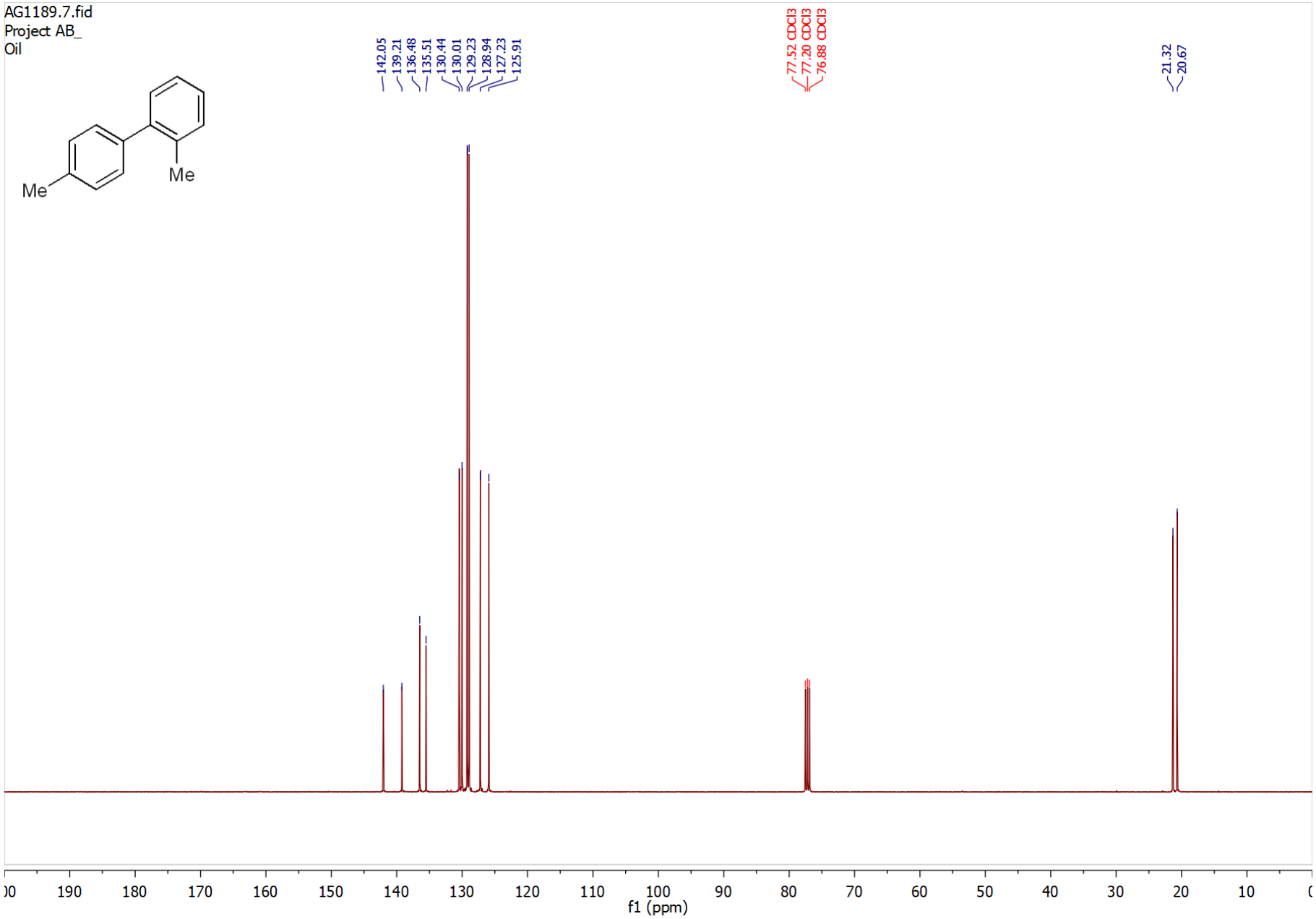
Compound 3j


AG1185.4.fid
Project AB_
Oil
Me
Me
Me
141.35
138.74
138.33
136.93
129.53
128.79
127.18
125.09
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.58
21.25
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

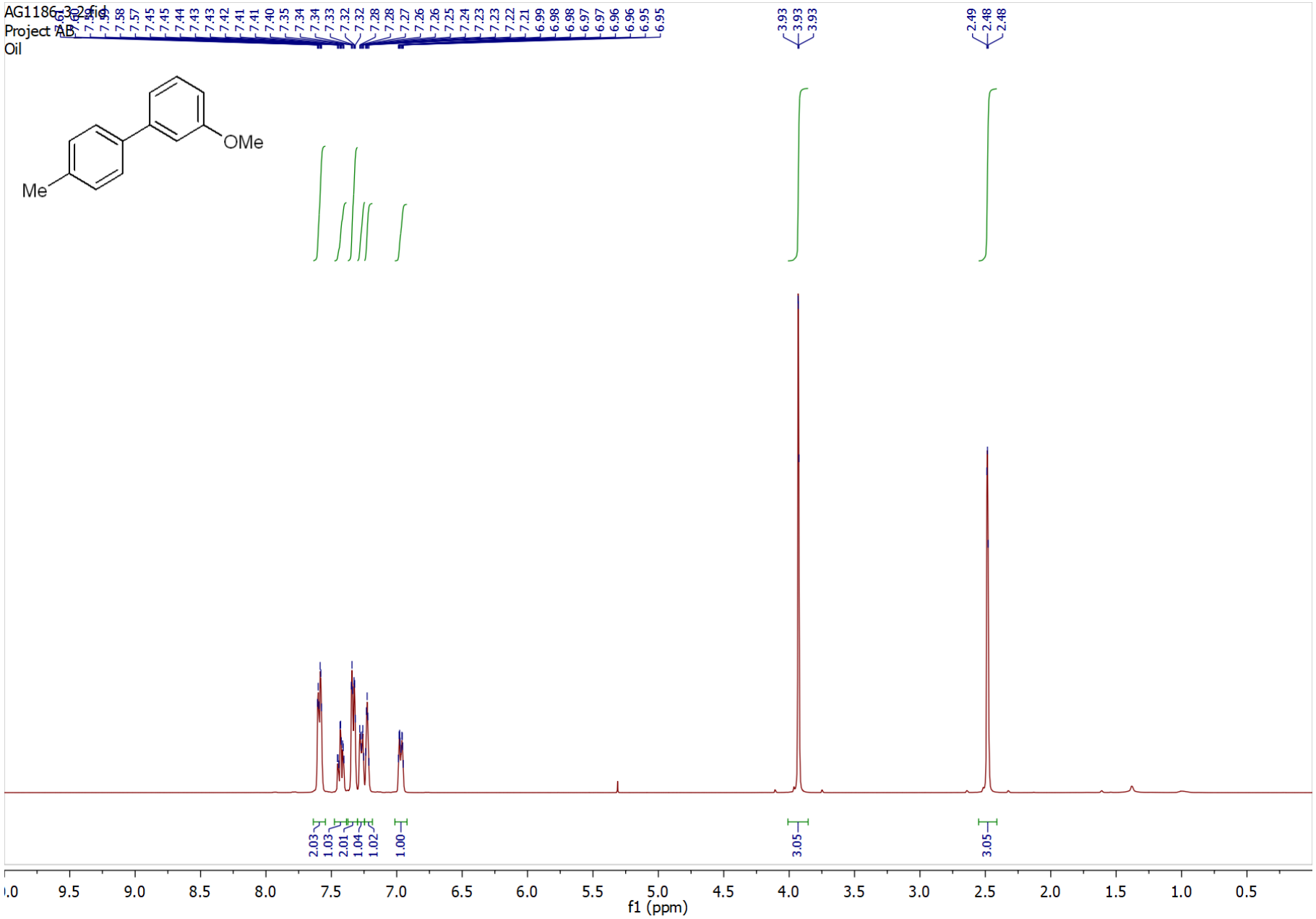
Compound 3k


AG1189.5.fid
Project AB_
Oil
Me
Me
7.42
7.42
7.41
7.40
7.40
7.39
7.38
7.38
7.37
7.26 CDCl3
2.56
2.56
2.55
2.55
2.45
2.44
2.44
2.43
7.95
3.03
3.00
f1 (ppm)

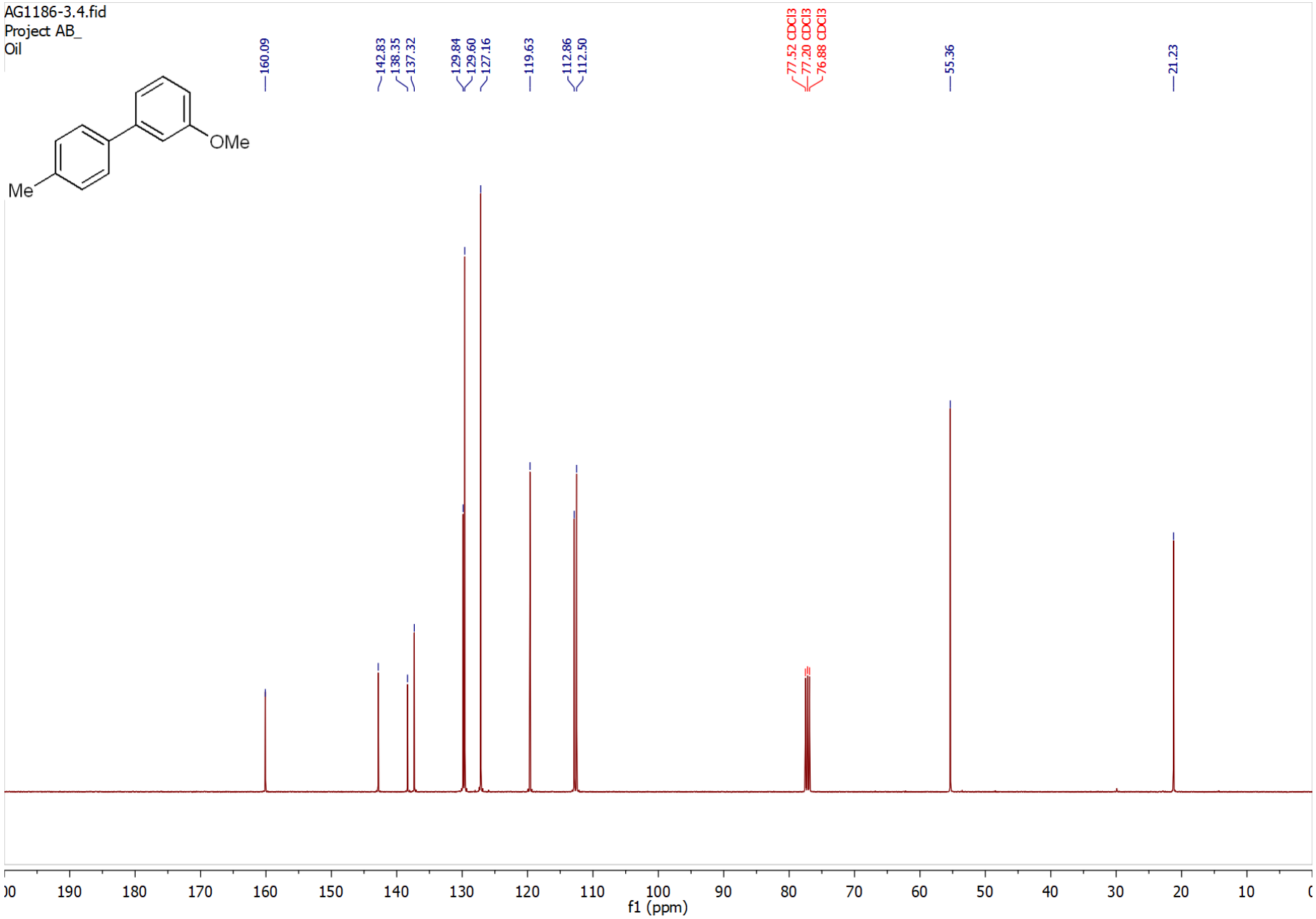
Compound 3k


AG1189.7.fid
Project AB_
Oil
142.05
139.21
136.48
135.51
130.44
130.01
129.23
128.94
127.23
125.91
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.32
20.67
Me
Me
f1 (ppm)

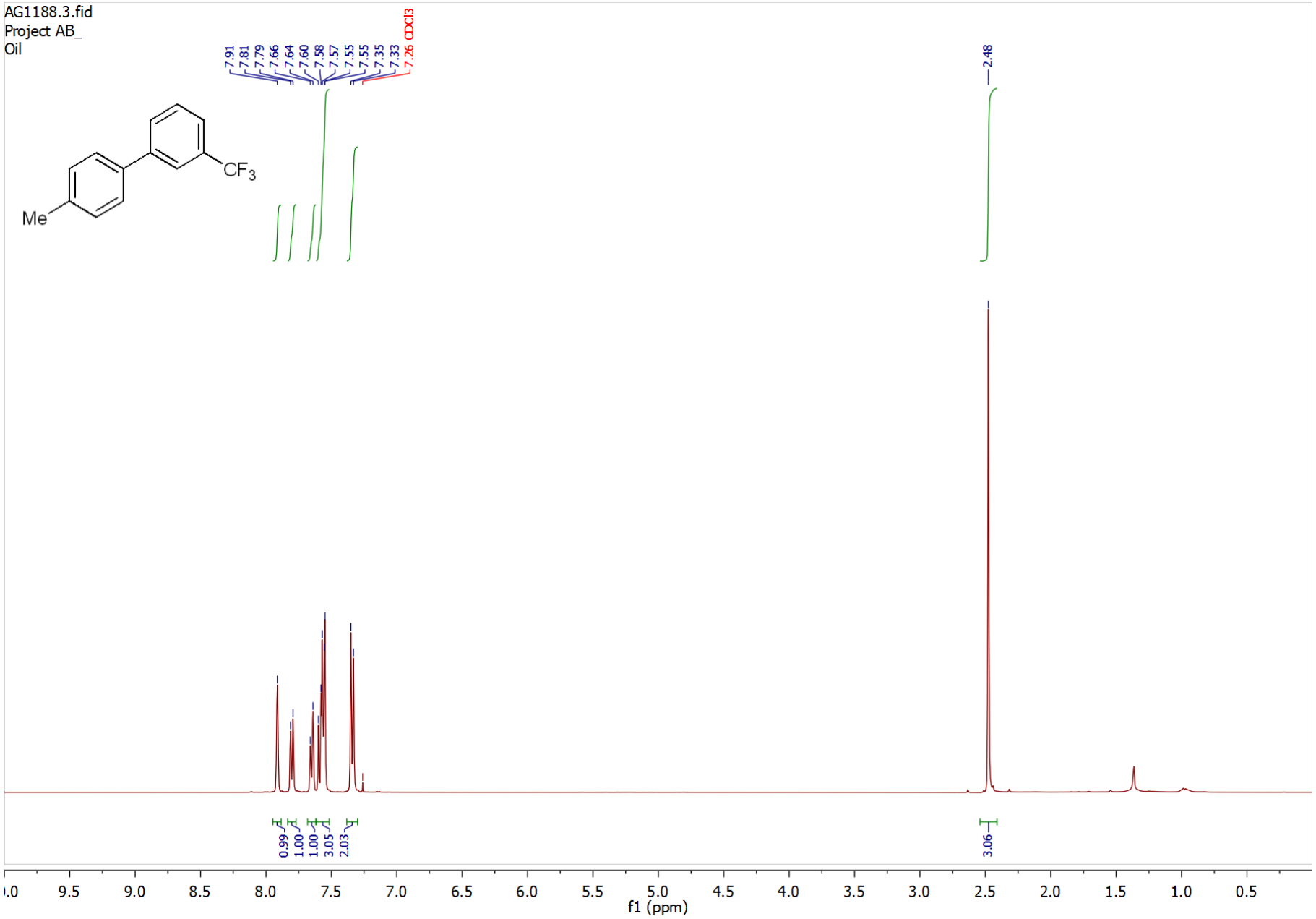
Compound 3l



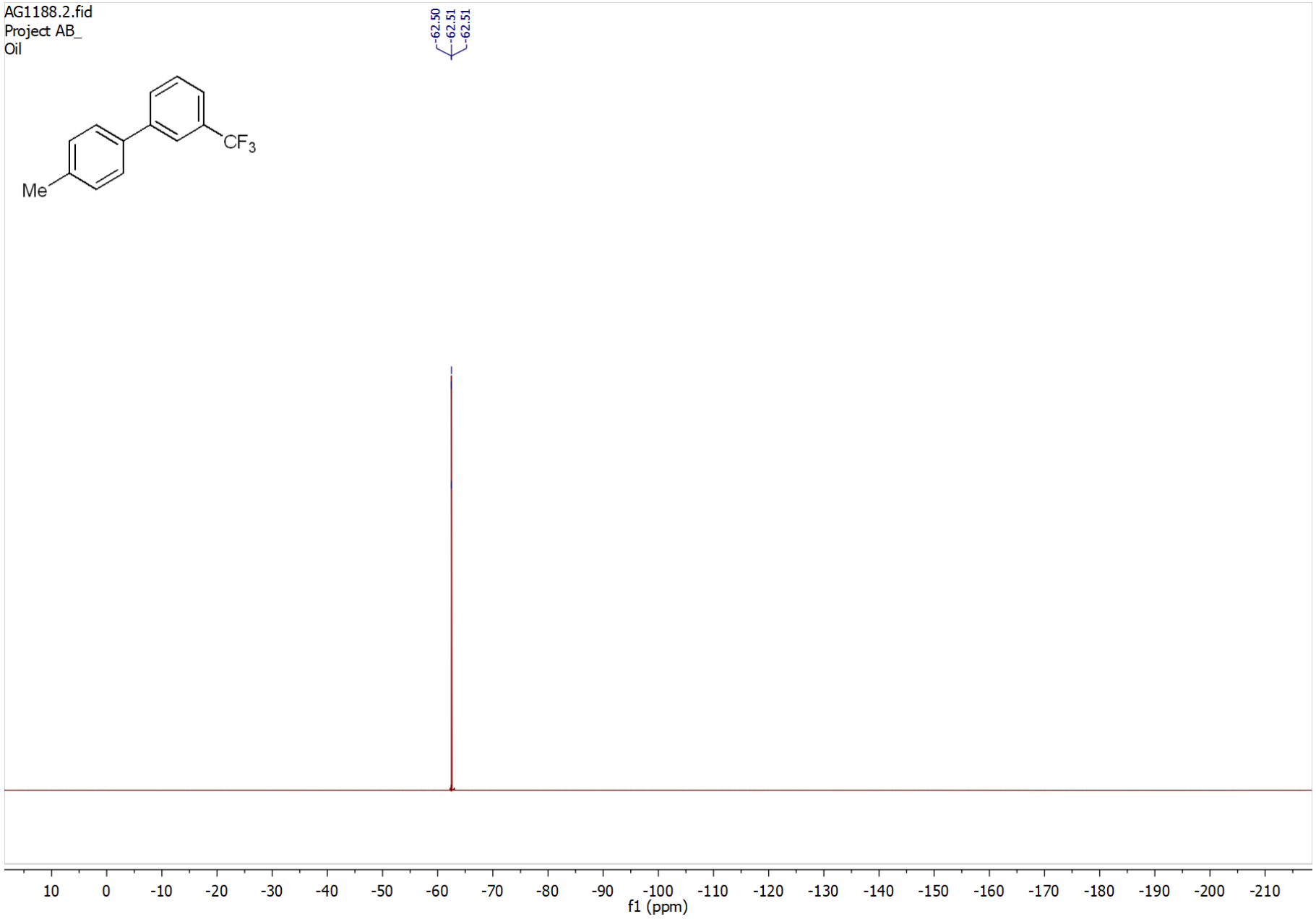
Compound 3l


AG1186-3.4.fid
Project AB_
Oil
160.09
142.83
138.35
137.32
129.84
129.60
127.16
119.63
112.86
112.50
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.36
21.23
OMe
Me
f1 (ppm)

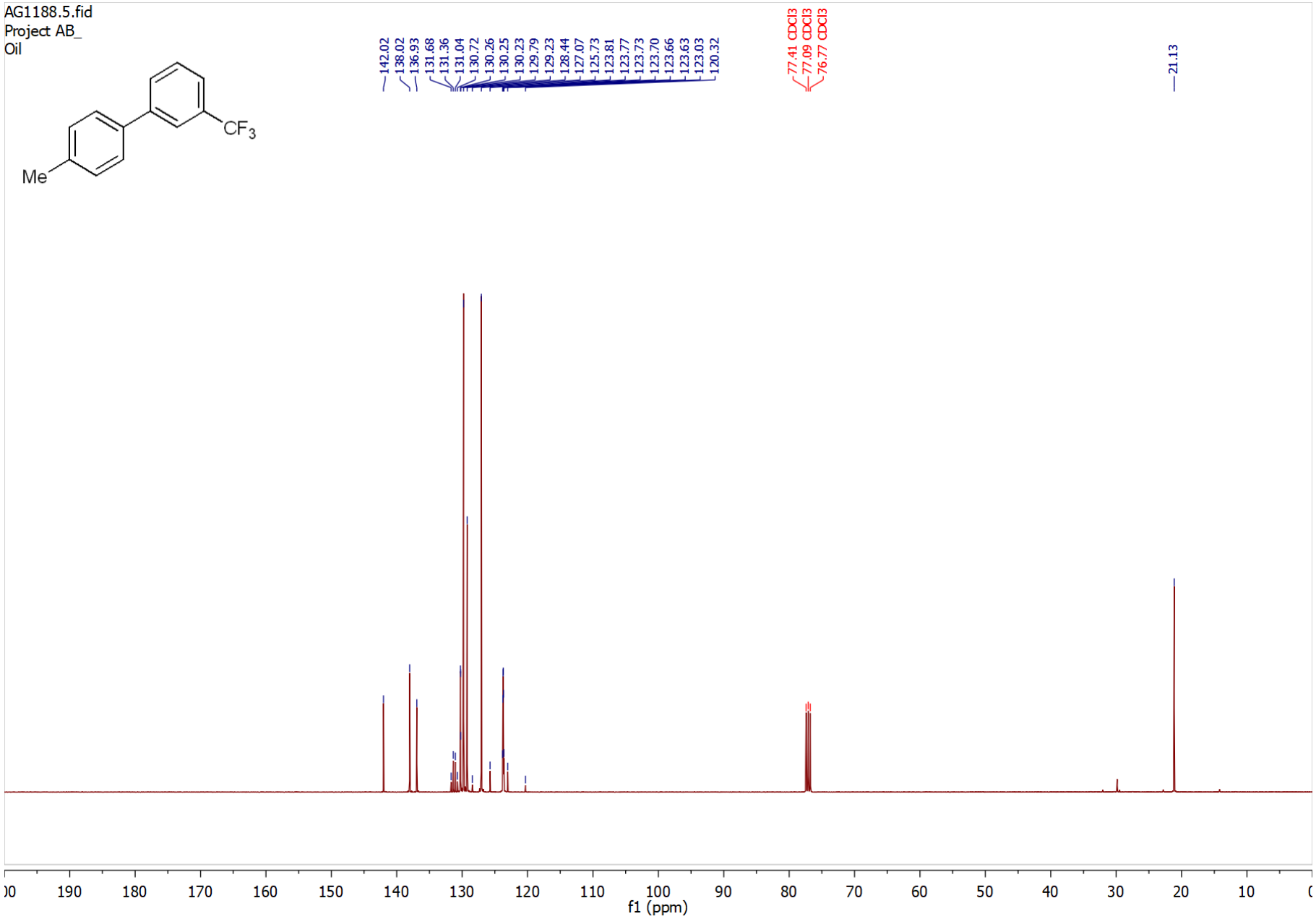
Compound 3m


AG1188.3.fid
Project AB_
Oil
7.91
7.81
7.79
7.66
7.64
7.60
7.58
7.57
7.55
7.55
7.35
7.33
7.26 CDCl3
2.48
CF3
Me
0.99
1.00
1.00
3.05
2.03
3.06
f1 (ppm)

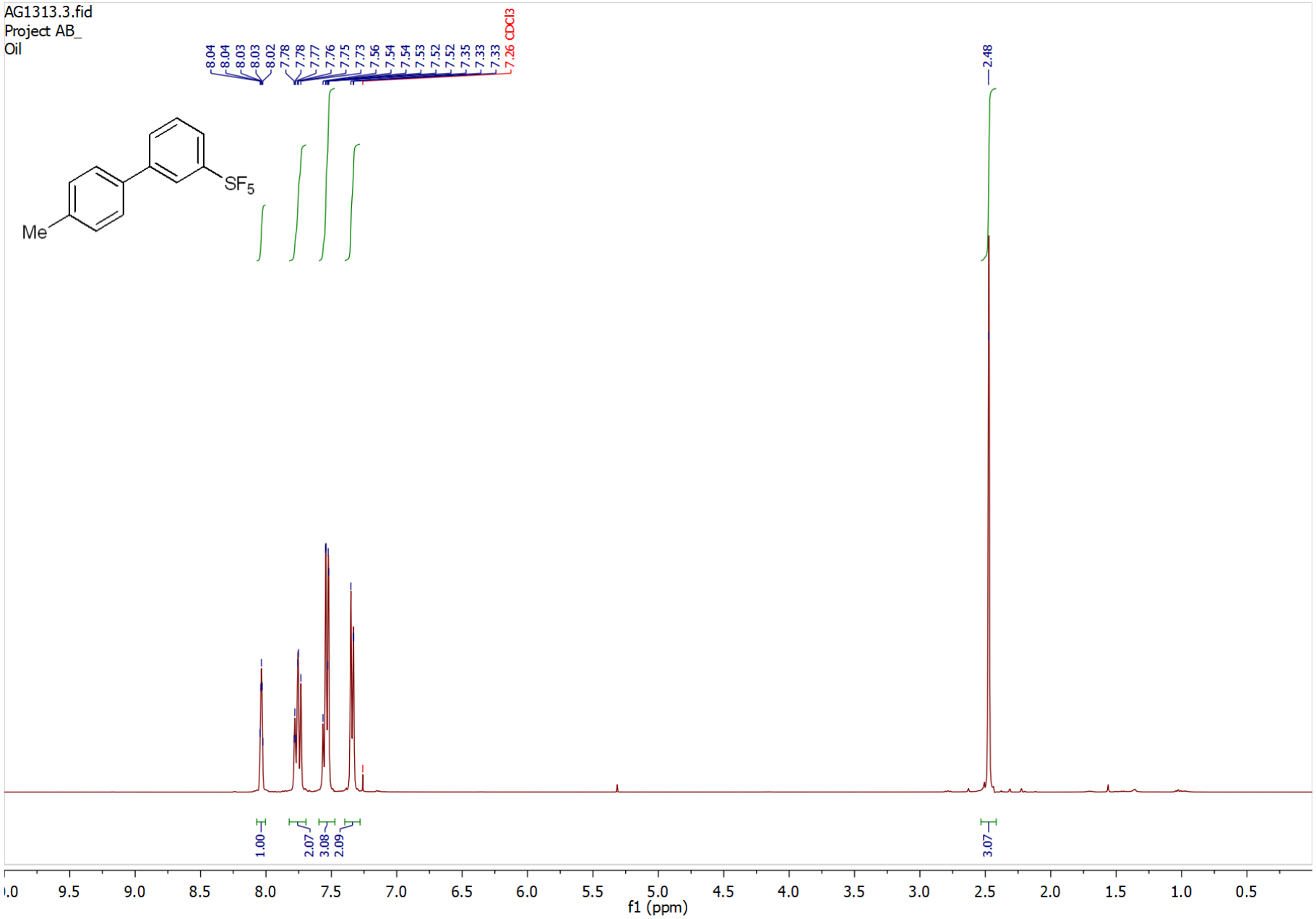
Compound 3m


AG1188.2.fid
Project AB_
Oil
-62.50
-62.51
-62.51
CF3
Me
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

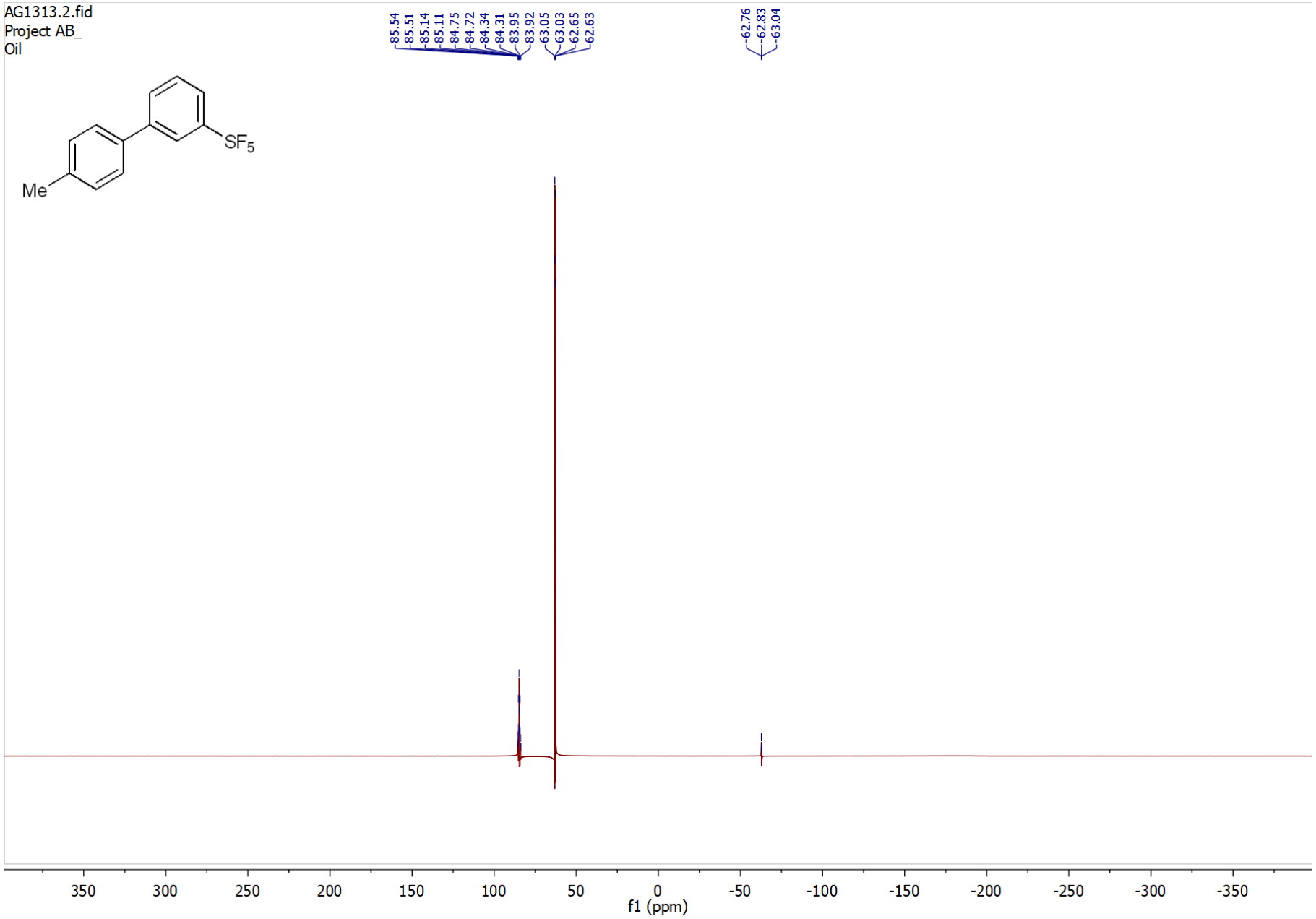
Compound 3m


AG1188.5.fid
Project AB_
Oil
Me
CF3
142.02
138.02
136.93
131.68
131.36
131.04
130.72
130.26
130.25
130.23
129.79
129.23
128.44
127.07
125.73
123.81
123.77
123.73
123.70
123.66
123.63
123.03
120.32
77.41 CDCl3
77.09 CDCl3
76.77 CDCl3
21.13
f1 (ppm)

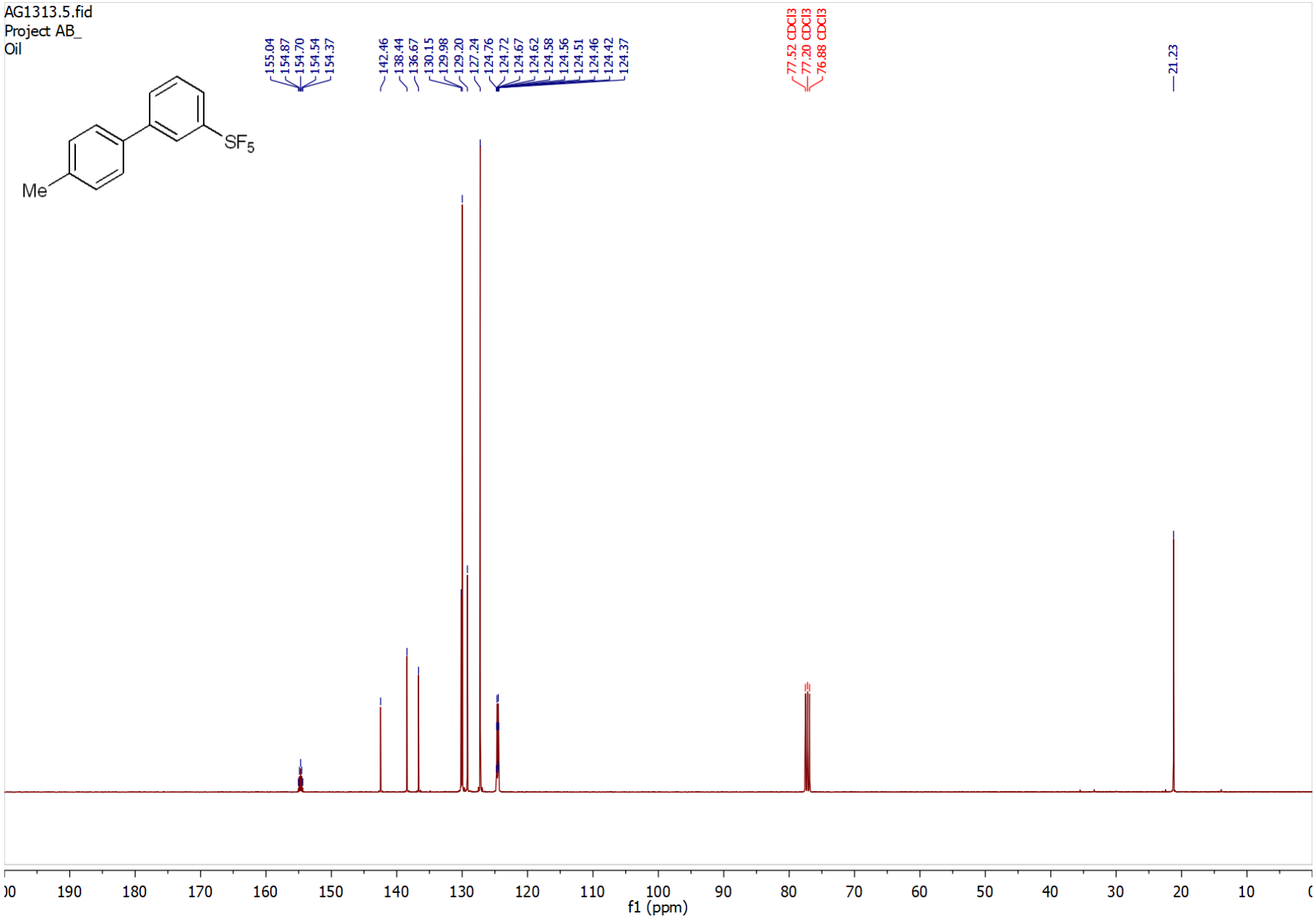
Compound 3n


AG1313.3.fid
Project AB_
Oil
8.04
8.04
8.03
8.03
8.02
7.78
7.78
7.77
7.76
7.75
7.73
7.56
7.54
7.54
7.53
7.52
7.52
7.35
7.33
7.33
7.26 CDCl3
2.48
SF5
Me
1.00
2.07
3.08
2.09
3.07
f1 (ppm)

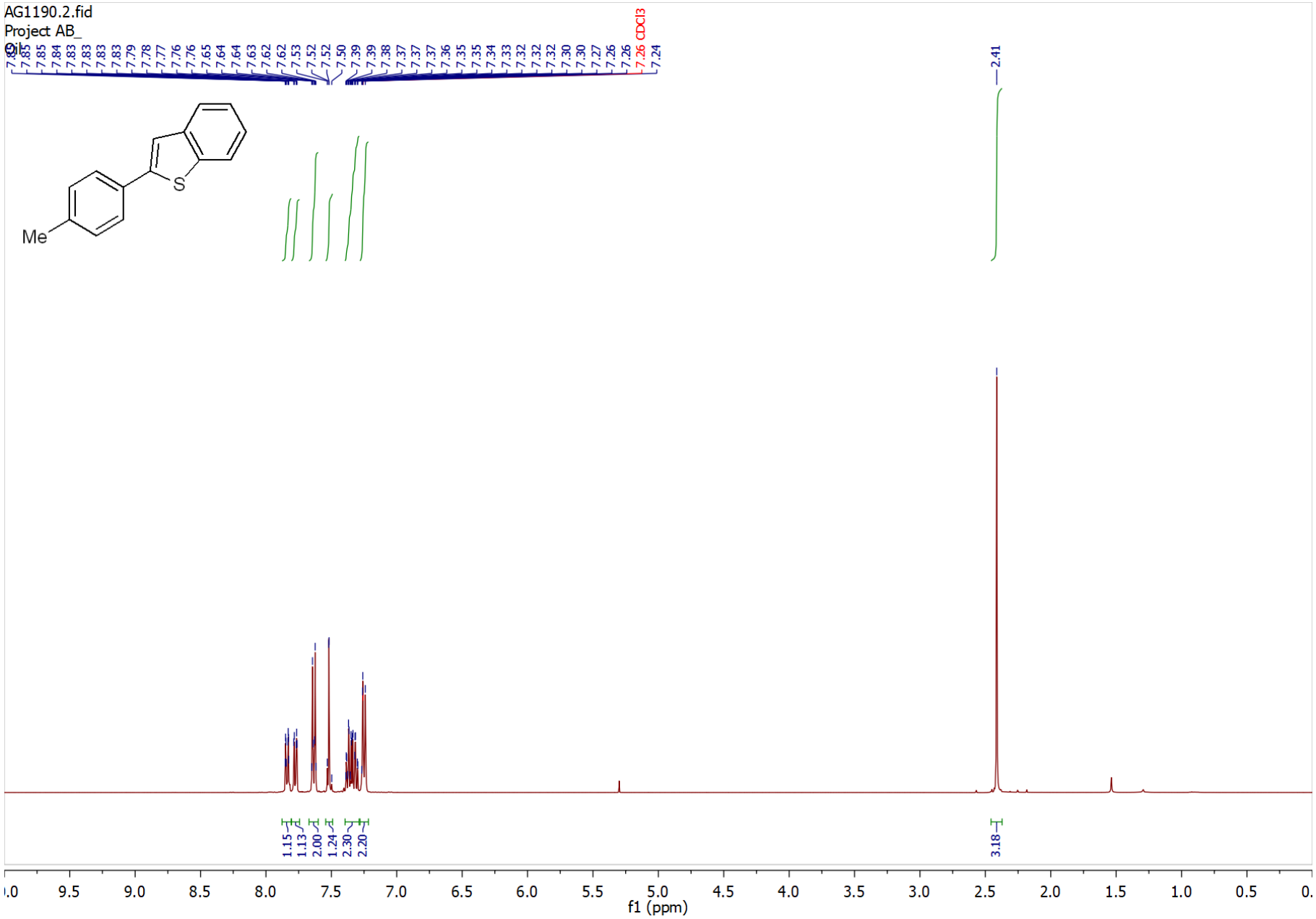
Compound 3n


AG1313.2.fid
Project AB_
Oil
85.54
85.51
85.14
85.11
84.75
84.72
84.34
84.31
83.95
83.92
63.05
63.03
62.65
62.63
62.76
62.83
63.04
SF5
Me
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
-350
f1 (ppm)

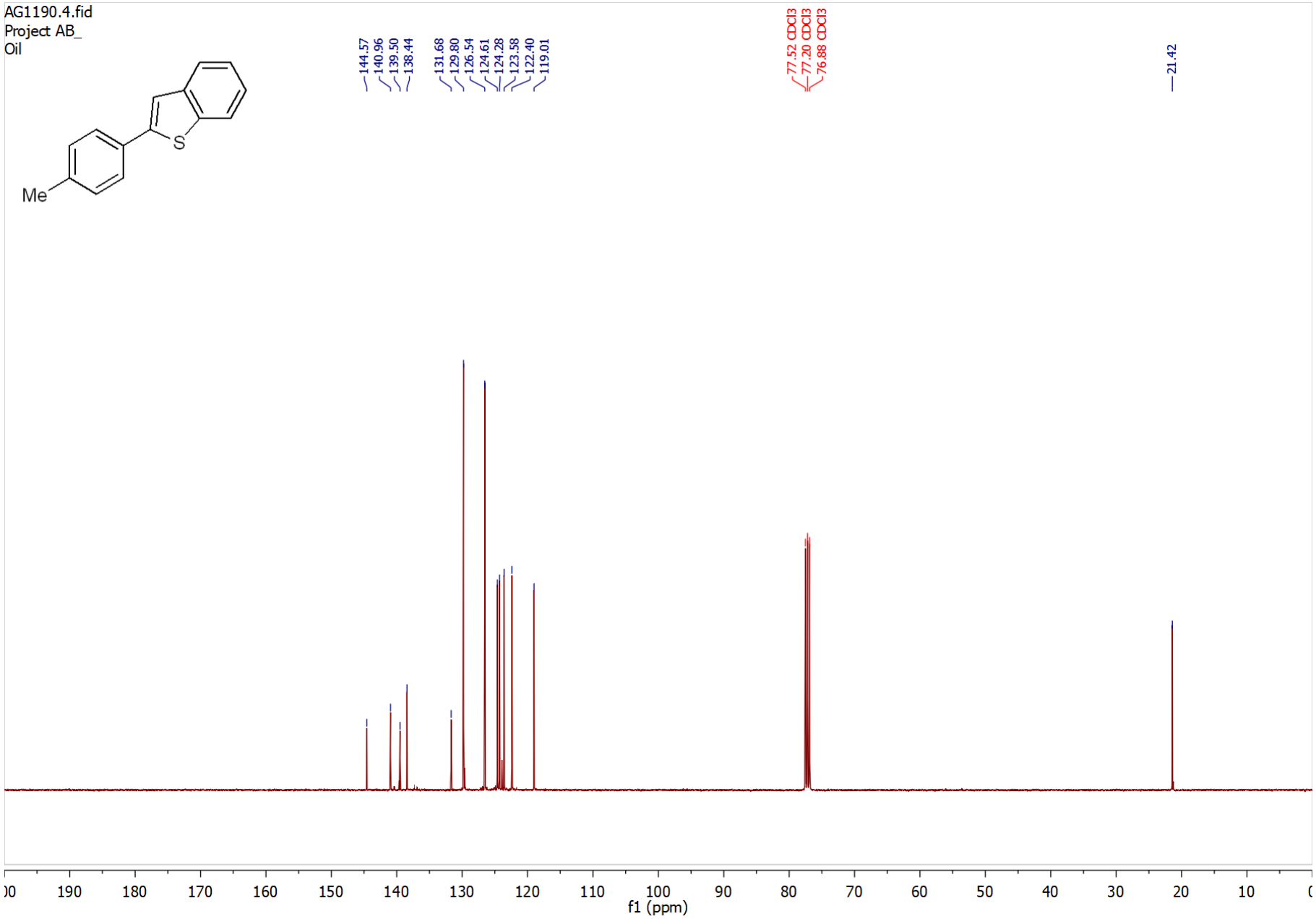
Compound 3n


AG1313.5.fid
Project AB_
Oil
155.04
154.87
154.70
154.54
154.37
142.46
138.44
136.67
130.15
129.98
129.20
127.24
124.76
124.72
124.67
124.62
124.58
124.56
124.51
124.46
124.42
124.37
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.23
SF5
Me
f1 (ppm)

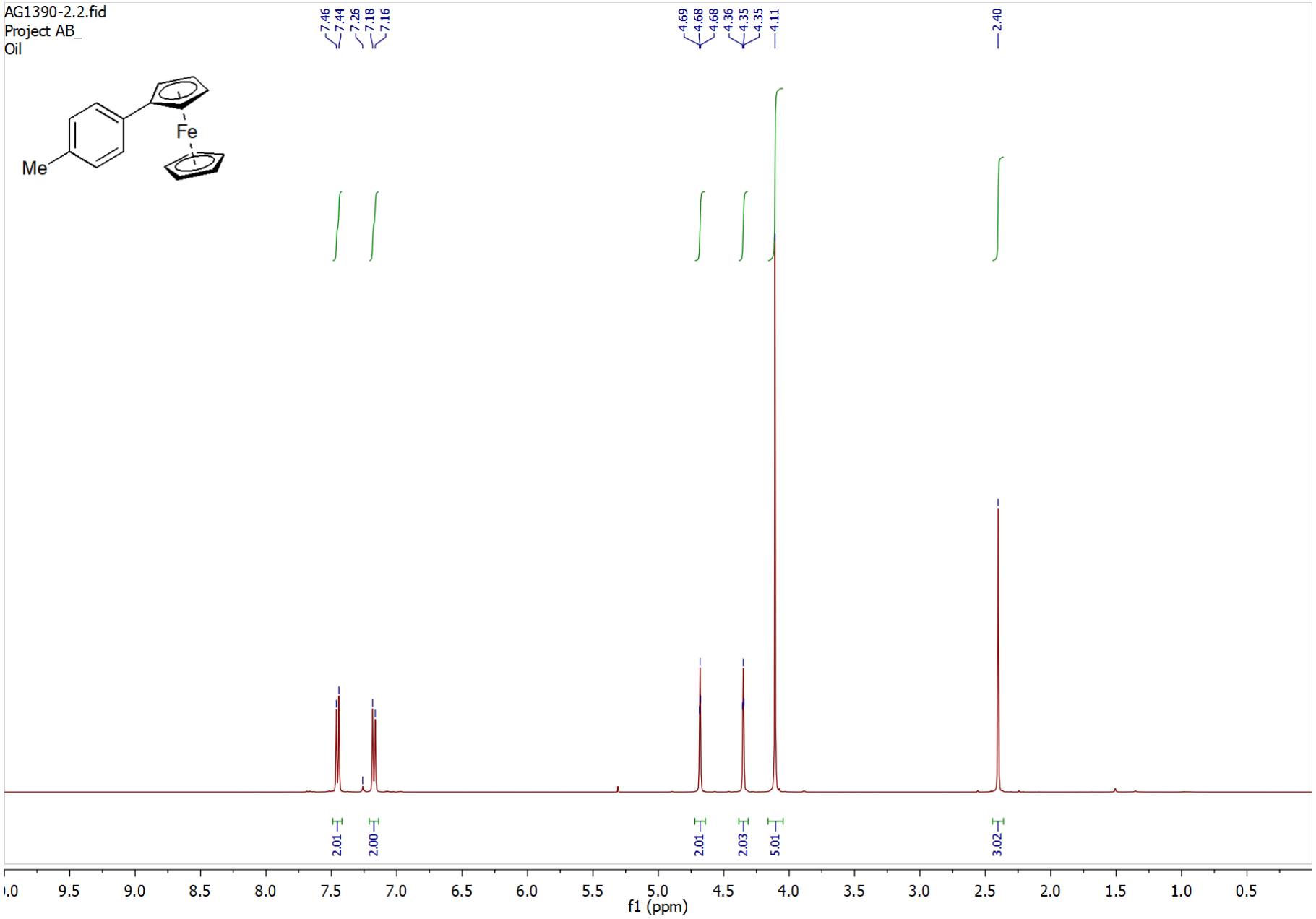
Compound 3o


AG1190.2.fid
Project AB_
Me
S
CDCl3
2.41
1.15
1.13
2.00
1.24
2.30
2.20
3.18
f1 (ppm)

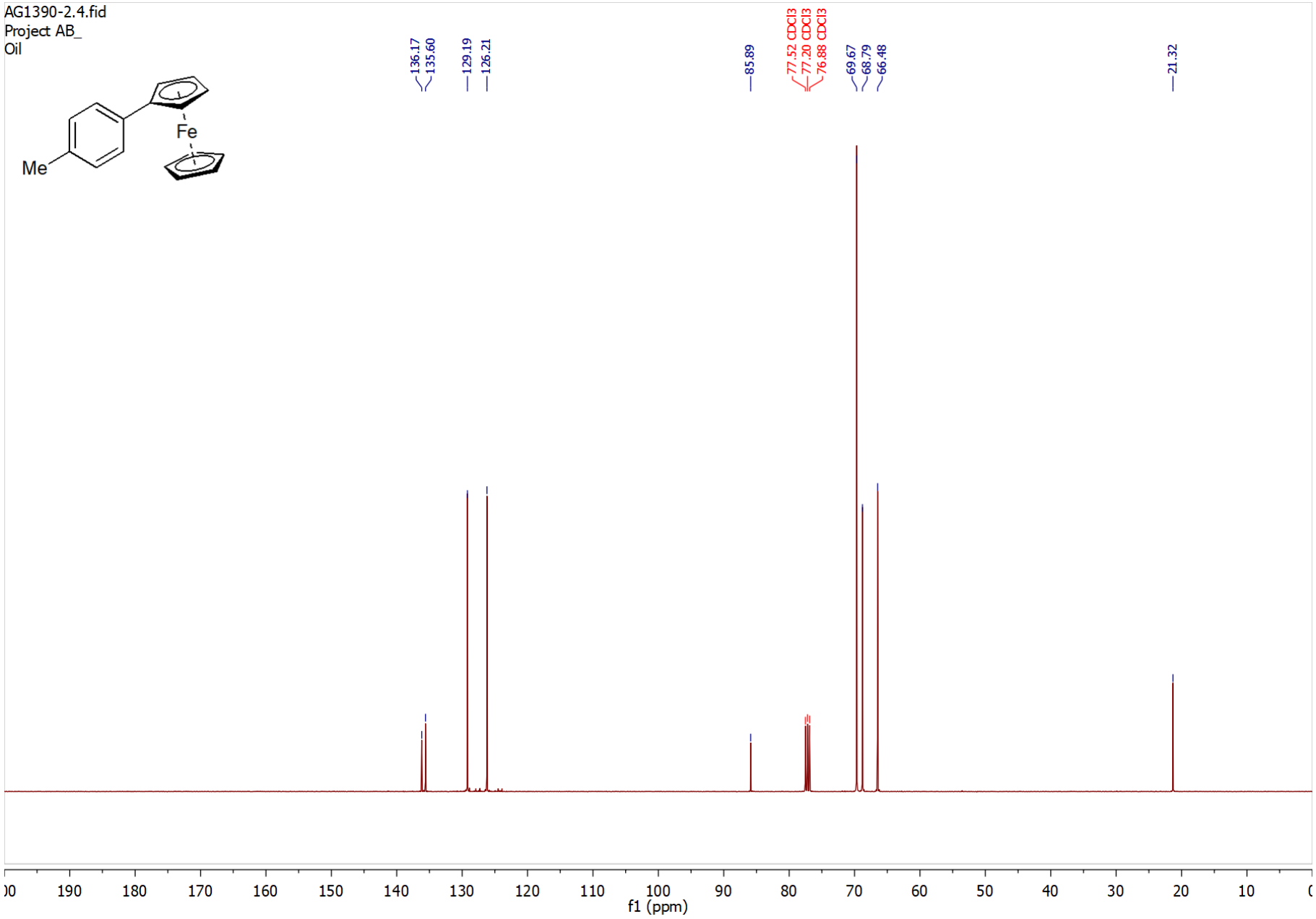
Compound 3o


AG1190.4.fid
Project AB_
Oil
Me
S
144.57
140.96
139.50
138.44
131.68
129.80
126.54
124.61
124.28
123.58
122.40
119.01
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.42
f1 (ppm)

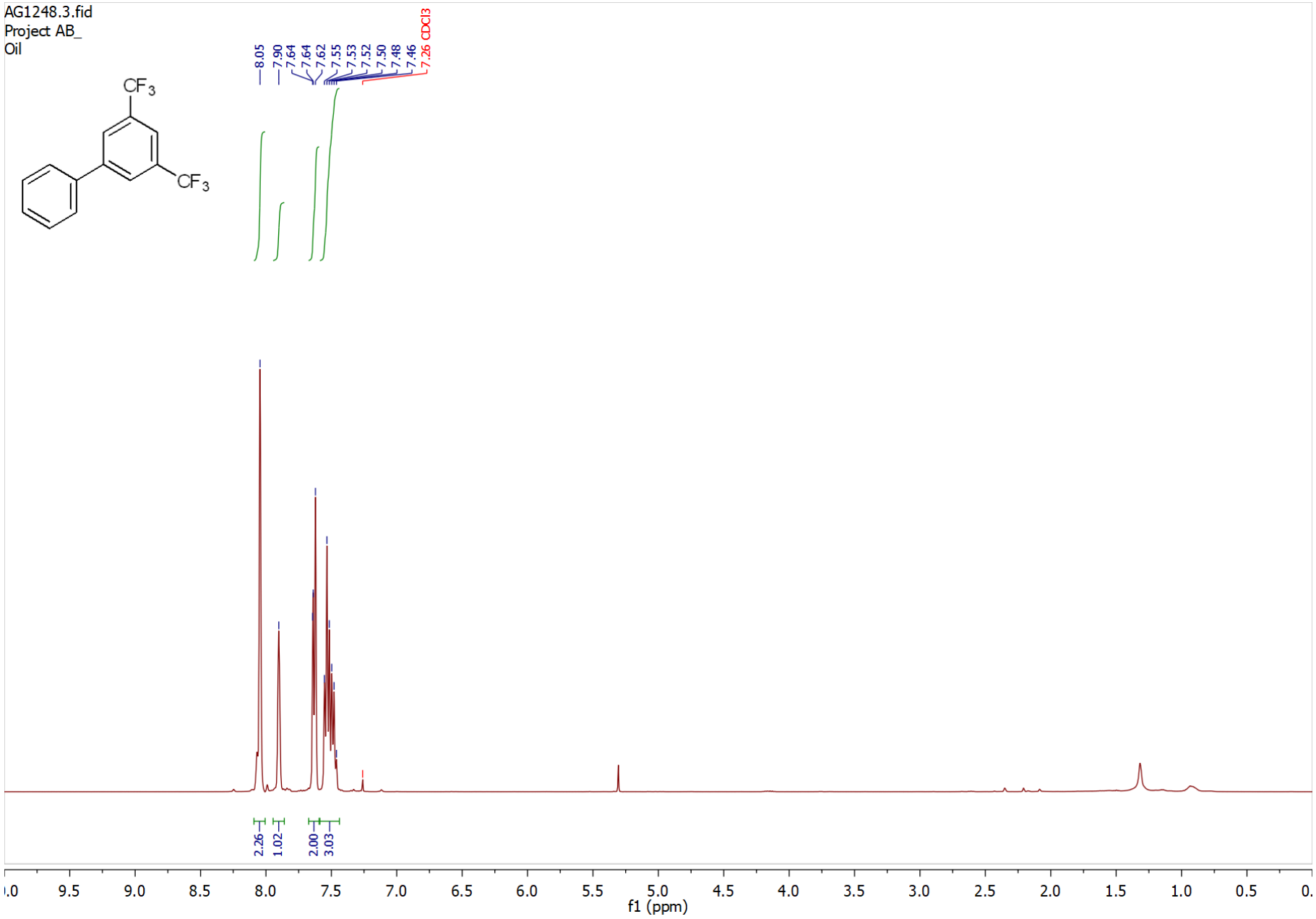
Compound 3p


AG1390-2.2.fid
Project AB_
Oil
Me
Fe
7.46
7.44
7.26
7.18
7.16
4.69
4.68
4.68
4.36
4.35
4.35
4.11
2.40
2.01
2.00
2.01
2.03
5.01
3.02
f1 (ppm)

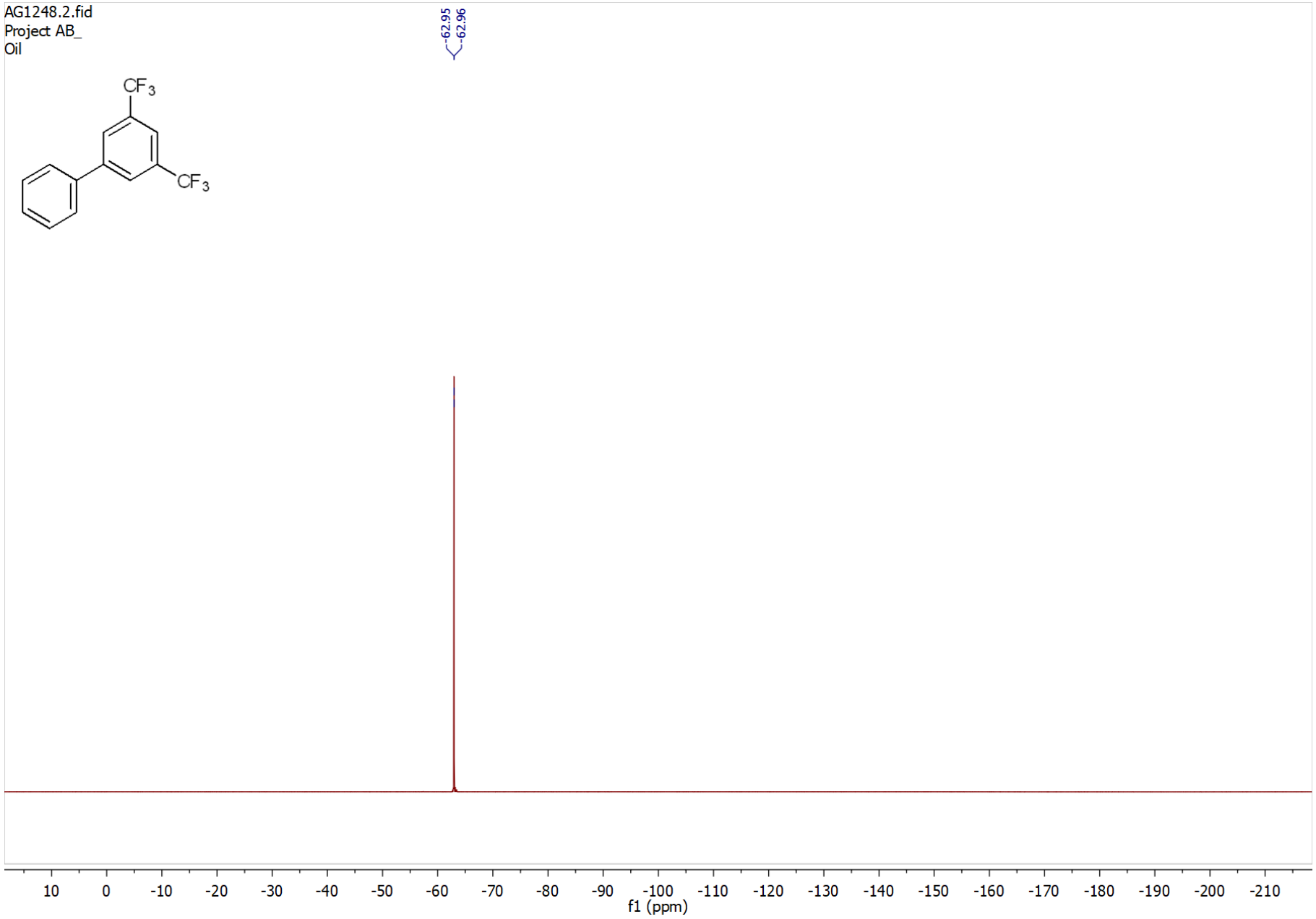
Compound 3p


AG1390-2.4.fid
Project AB_
Oil
Me
Fe
136.17
135.60
129.19
126.21
85.89
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
69.67
68.79
66.48
21.32
f1 (ppm)

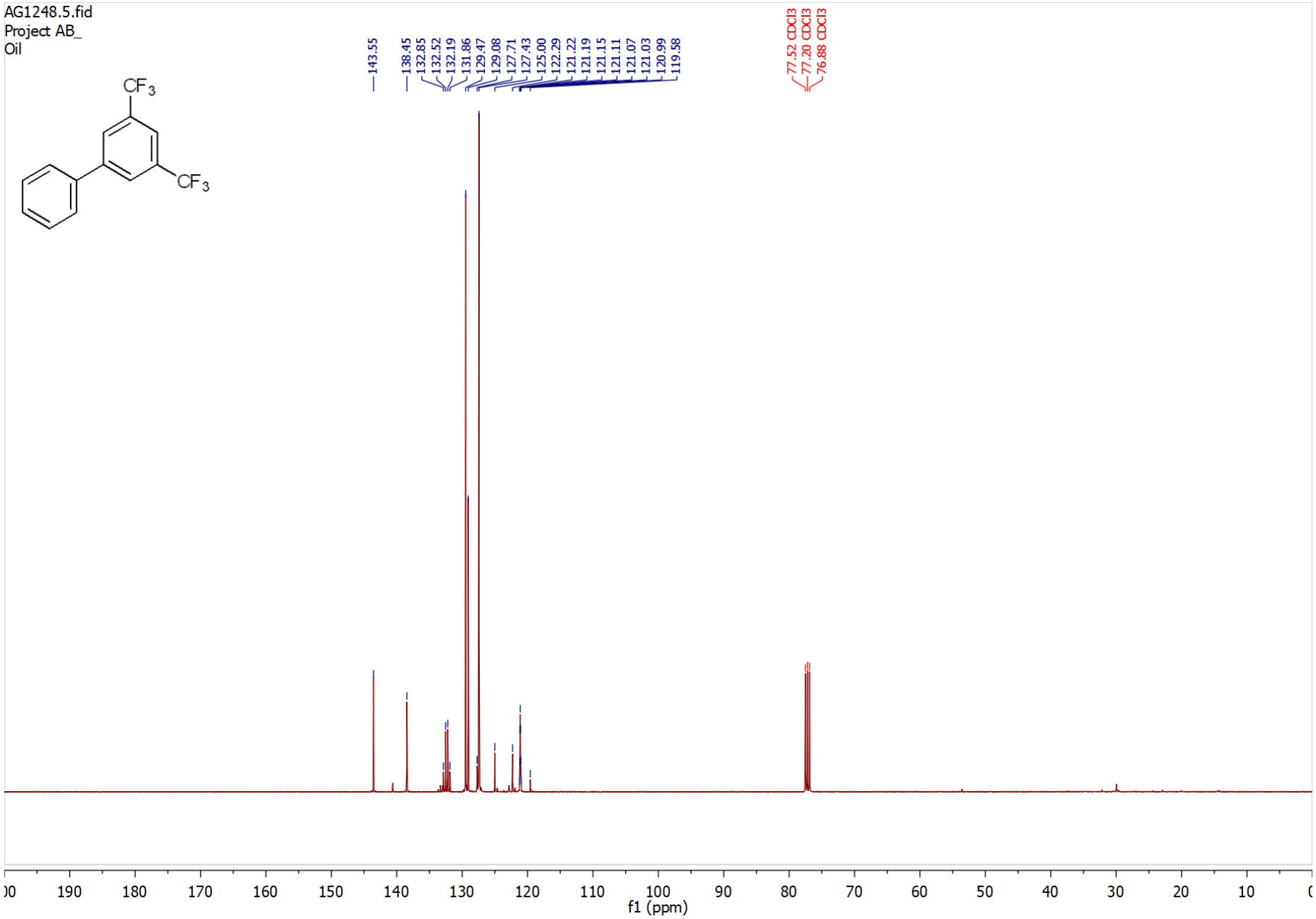
Compound 5a


AG1248.3.fid
Project AB_
Oil
CF3
CF3
8.05
7.90
7.64
7.64
7.62
7.55
7.53
7.52
7.50
7.48
7.46
7.26 CDCl3
2.26
1.02
2.00
3.03
f1 (ppm)

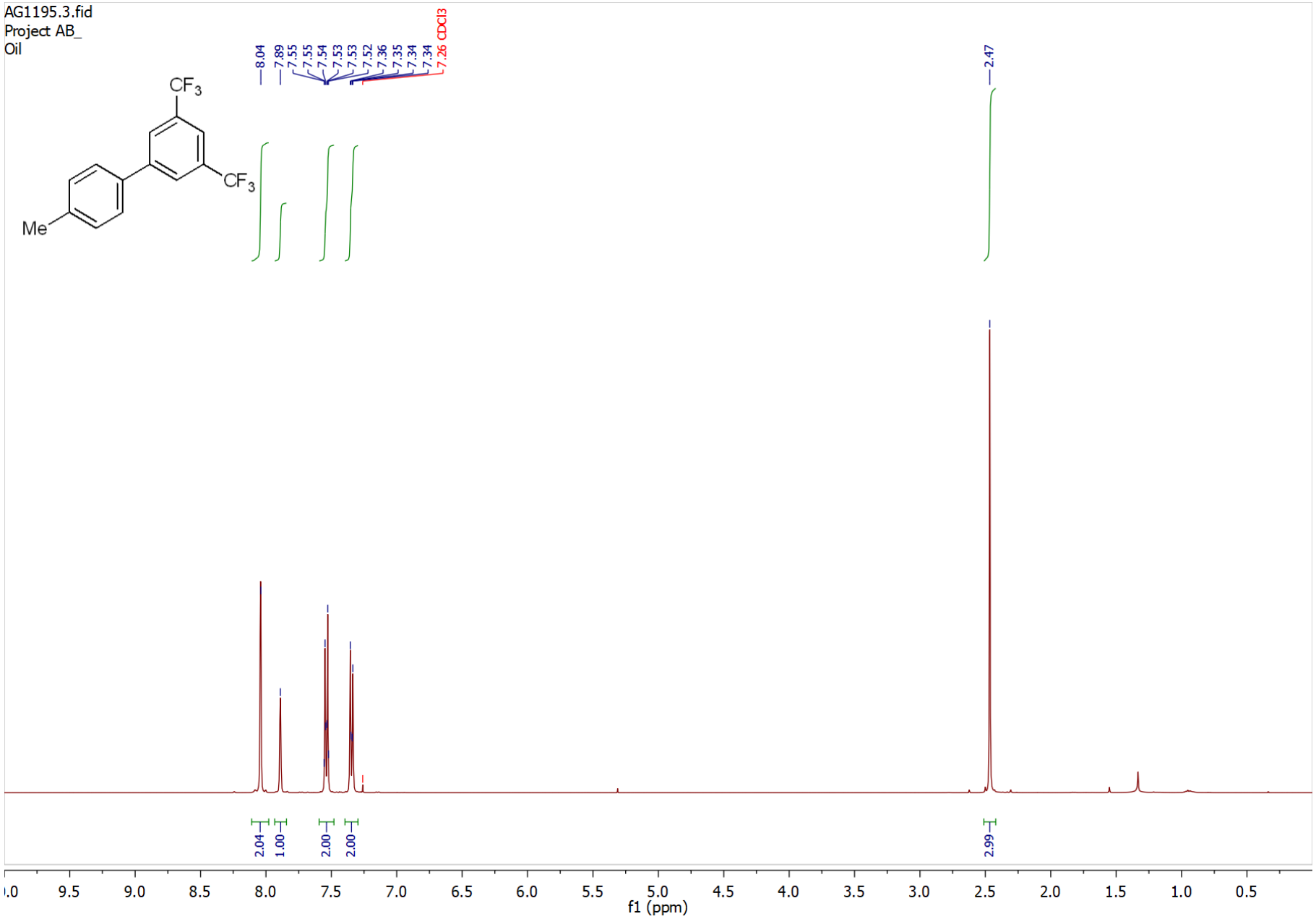
Compound 5a


AG1248.2.fid
Project AB_
Oil
-62.95
-62.96
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

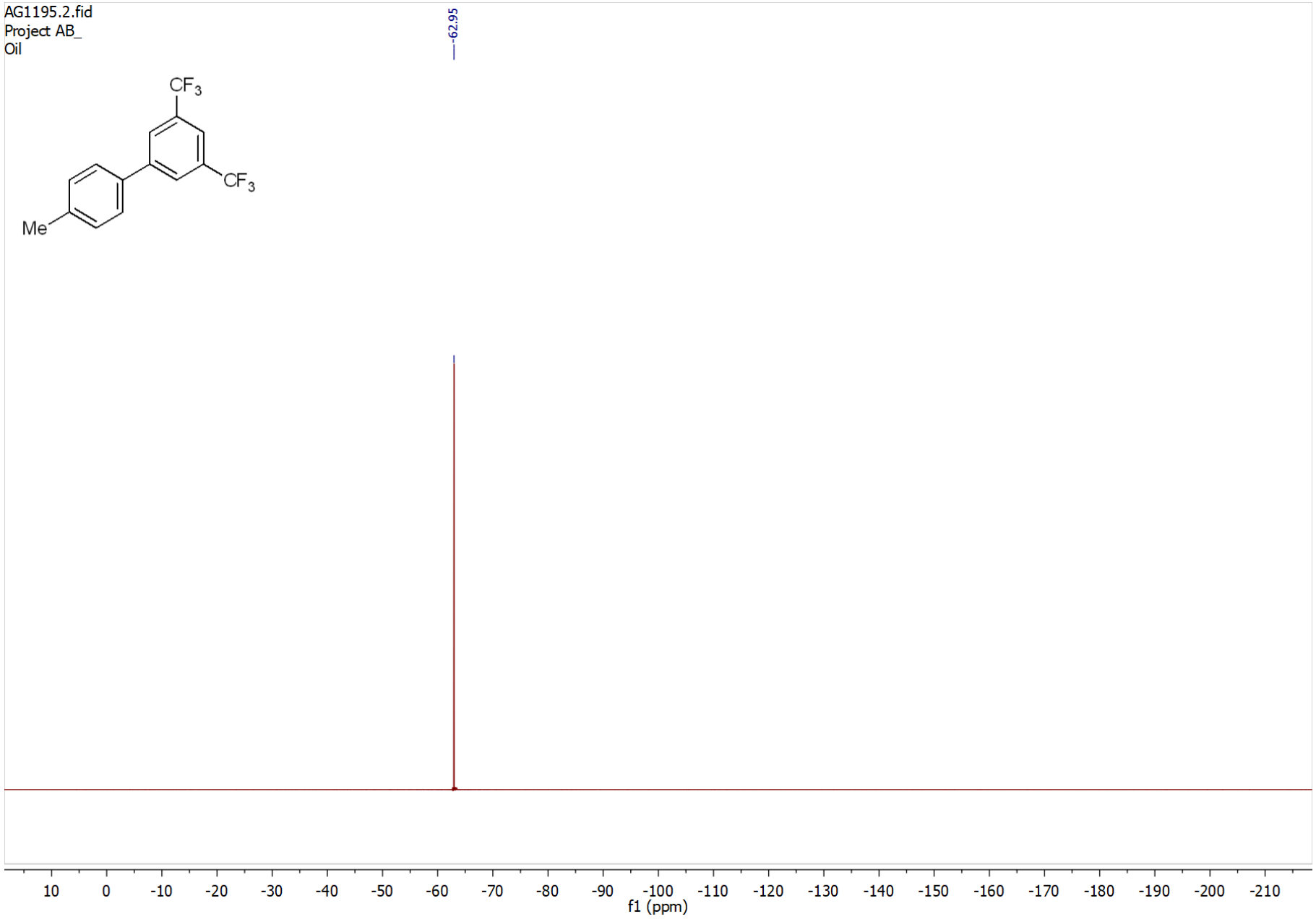
Compound 5a


AG1248.5.fid
Project AB_
Oil
CF3
CF3
143.55
138.45
132.85
132.52
132.19
131.86
129.47
129.08
127.71
127.43
125.00
122.29
121.22
121.19
121.15
121.11
121.07
121.03
120.99
119.58
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

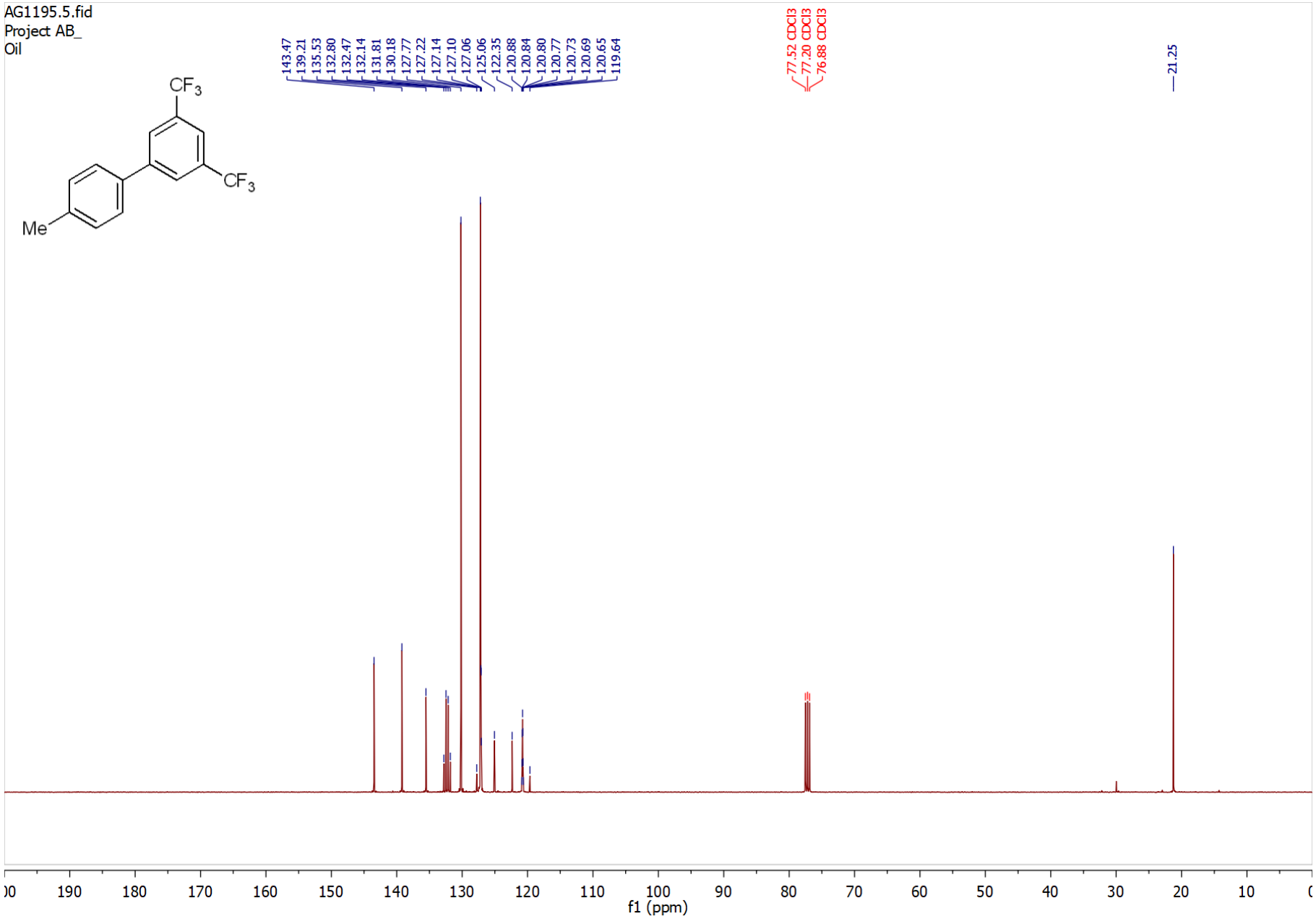
Compound 5b


AG1195.3.fid
Project AB_
Oil
8.04
7.89
7.55
7.55
7.54
7.53
7.53
7.52
7.36
7.35
7.34
7.34
7.26 CDCl3
2.47
CF3
CF3
Me
2.04
1.00
2.00
2.00
2.99
f1 (ppm)

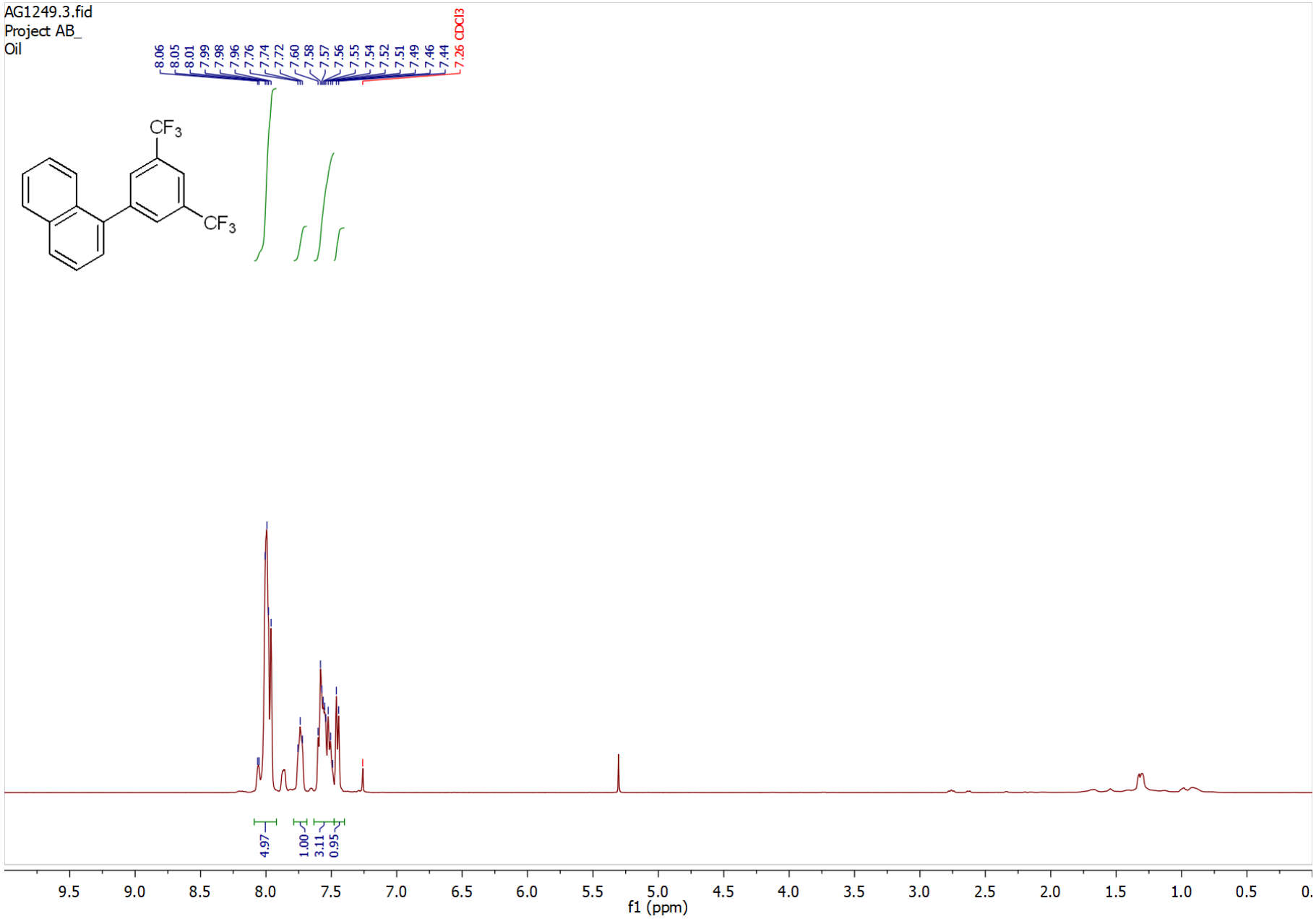
Compound 5b


AG1195.2.fid
Project AB_
Oil
-62.95
CF3
CF3
Me
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

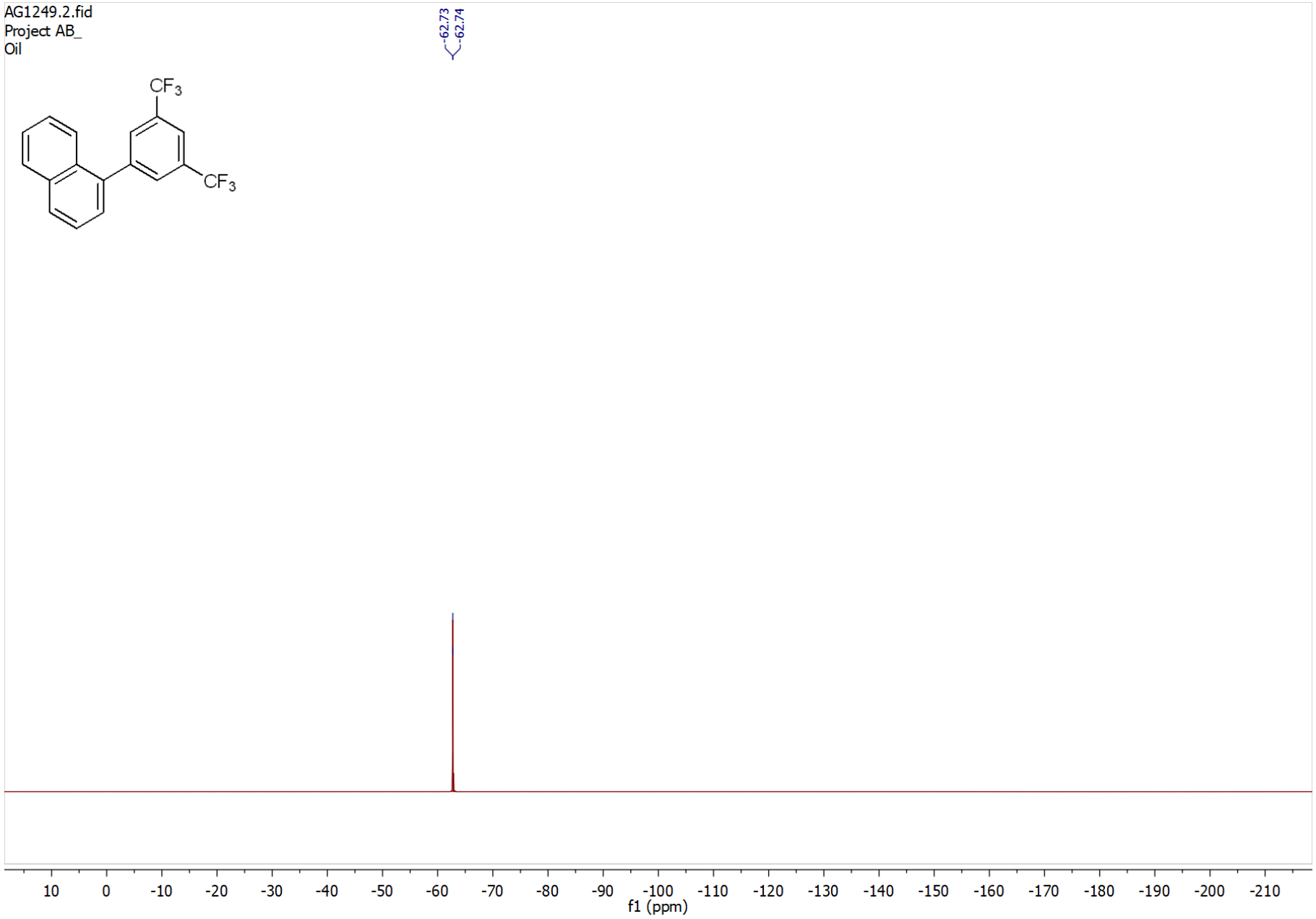
Compound 5b


AG1195.5.fid
Project AB_
Oil
143.47
139.21
135.53
132.80
132.47
132.14
131.81
130.18
127.77
127.22
127.14
127.10
127.06
125.06
122.35
120.88
120.84
120.80
120.77
120.73
120.69
120.65
119.64
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.25
CF3
CF3
Me
f1 (ppm)

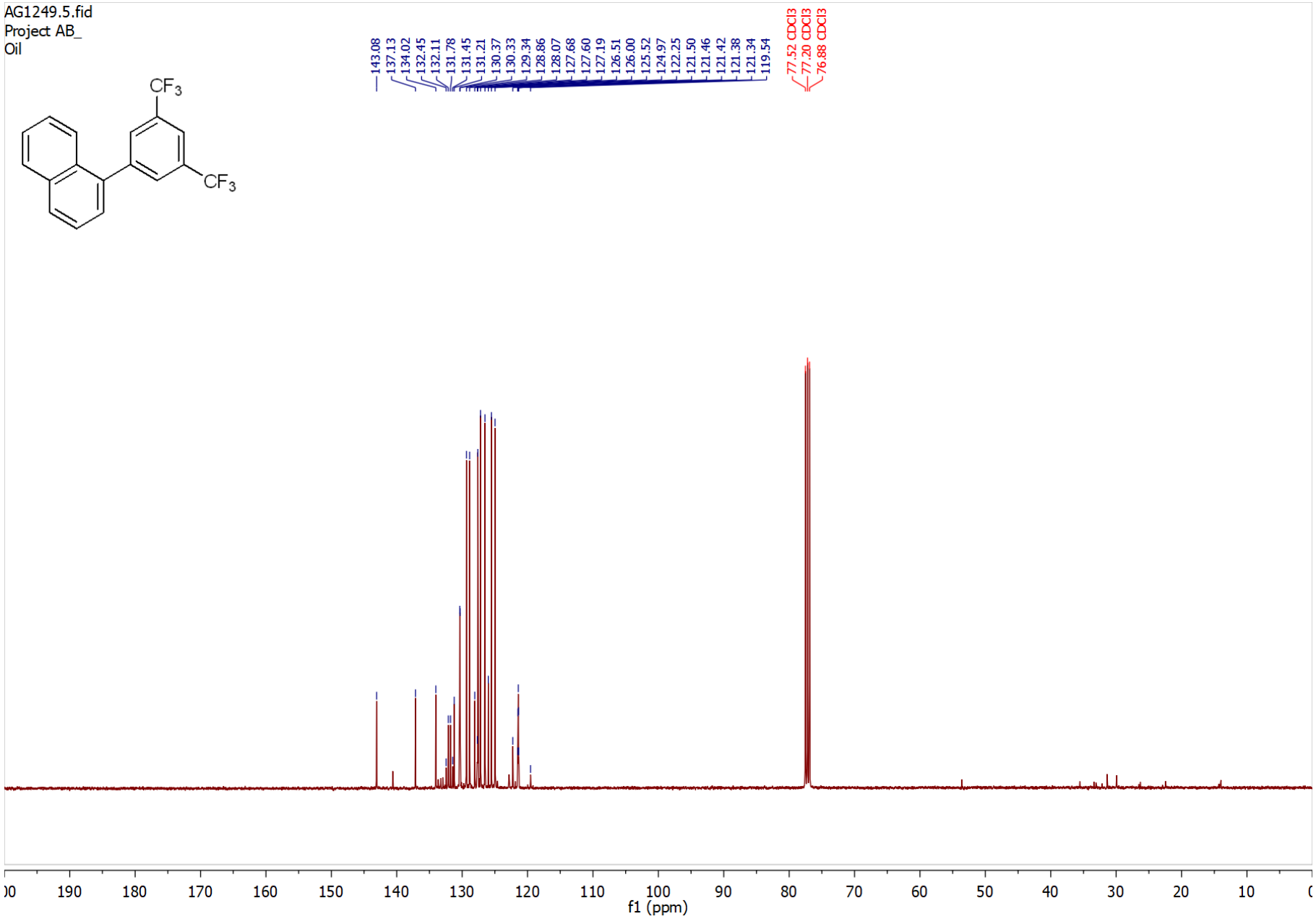
Compound 5c


AG1249.3.fid
Project AB_
Oil
8.06
8.05
8.01
7.99
7.98
7.96
7.76
7.74
7.72
7.60
7.58
7.57
7.56
7.55
7.54
7.52
7.51
7.49
7.46
7.44
7.26 CDCl3
CF3
CF3
4.97
1.00
3.11
0.95
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

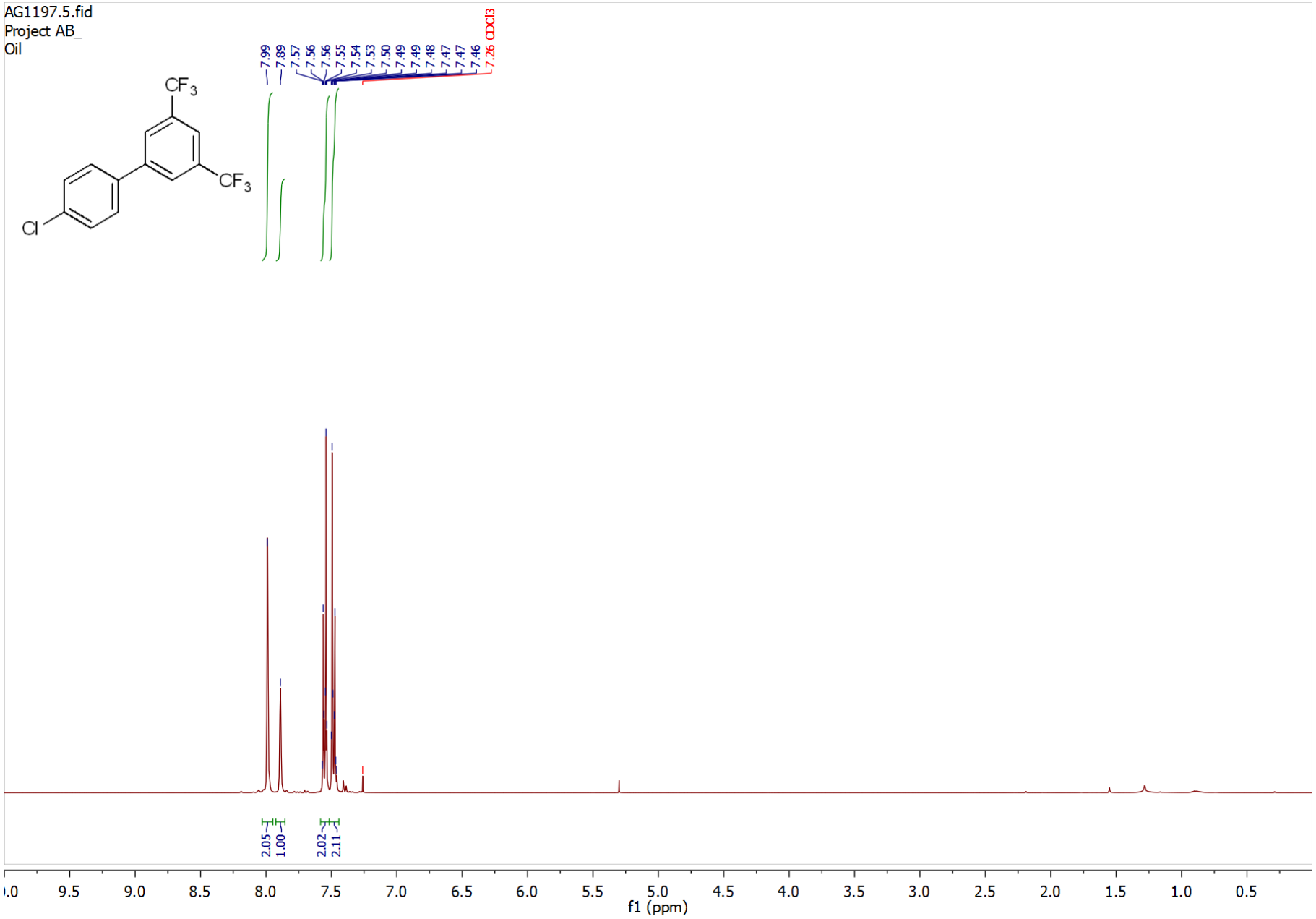
Compound 5c


AG1249.2.fid
Project AB_
Oil
-62.73
-62.74
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

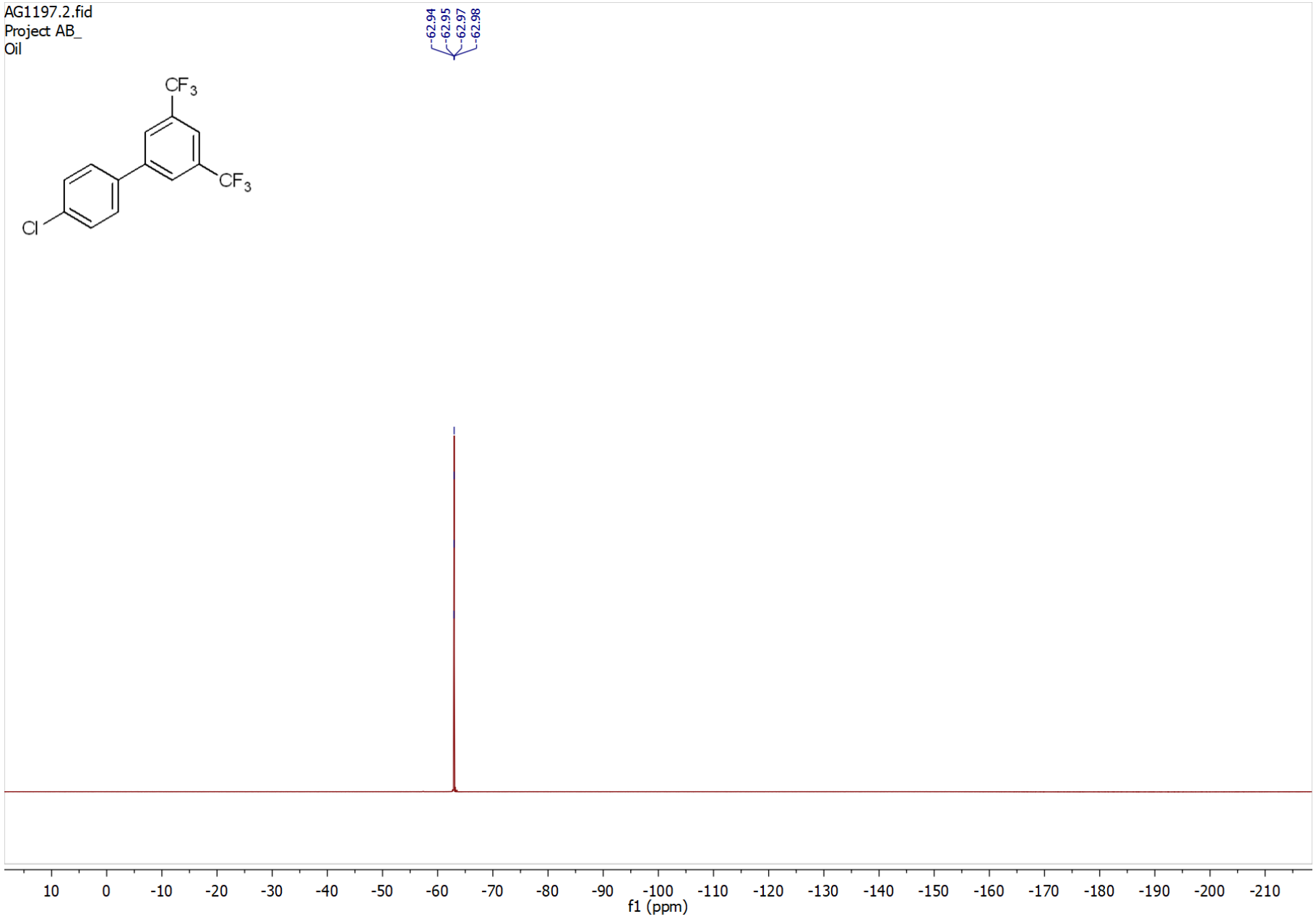
Compound 5c


AG1249.5.fid
Project AB_
Oil
143.08
137.13
134.02
132.45
132.11
131.78
131.45
131.21
130.37
130.33
129.34
128.86
128.07
127.68
127.60
127.19
126.51
126.00
125.52
124.97
122.25
121.50
121.46
121.42
121.38
121.34
119.54
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
f1 (ppm)

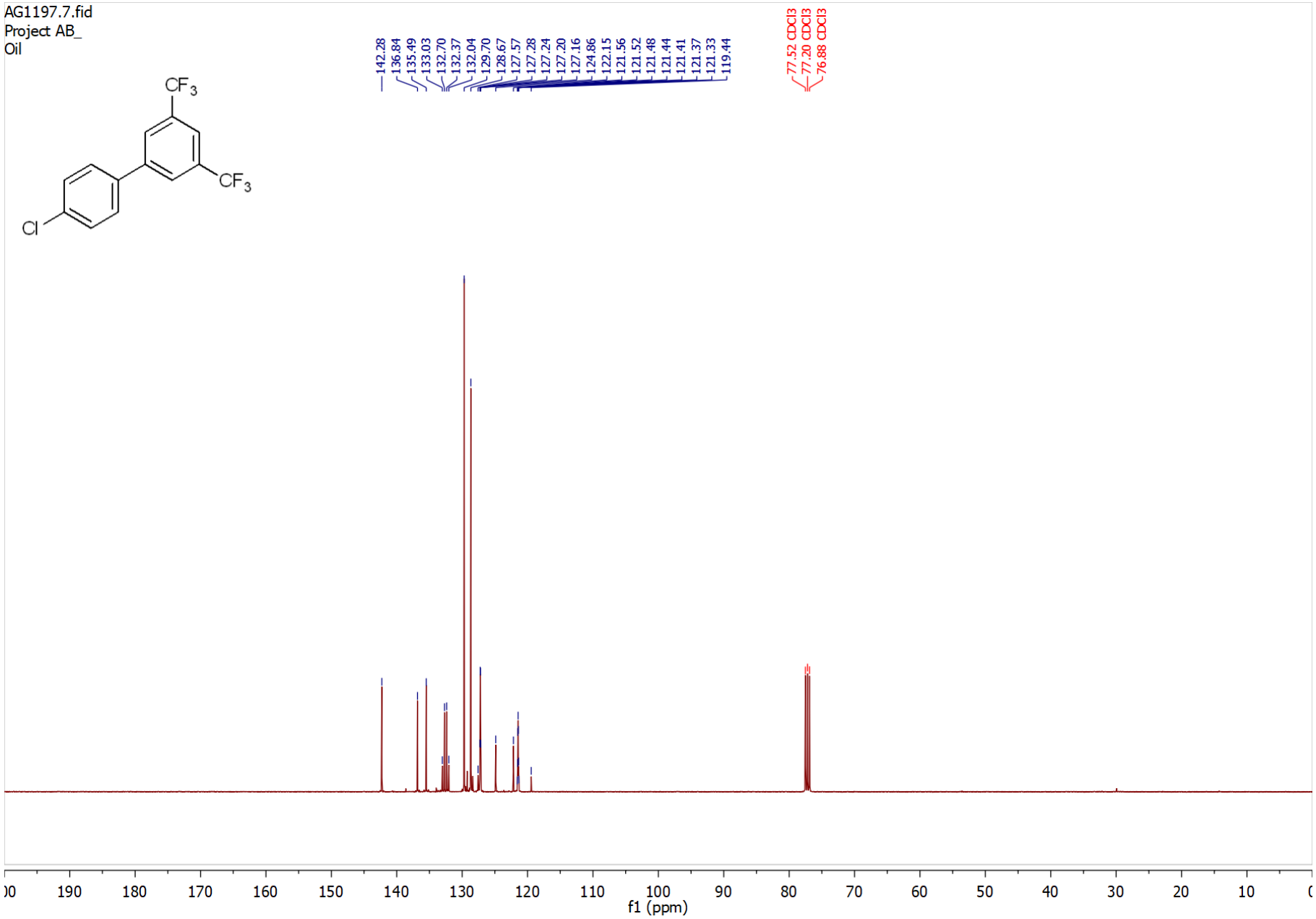
Compound 5d


AG1197.5.fid
Project AB_
Oil
CF3
CF3
Cl
7.99
7.89
7.57
7.56
7.56
7.55
7.54
7.53
7.50
7.49
7.49
7.48
7.47
7.47
7.46
7.26 CDCl3
2.05
1.00
2.02
2.11
f1 (ppm)

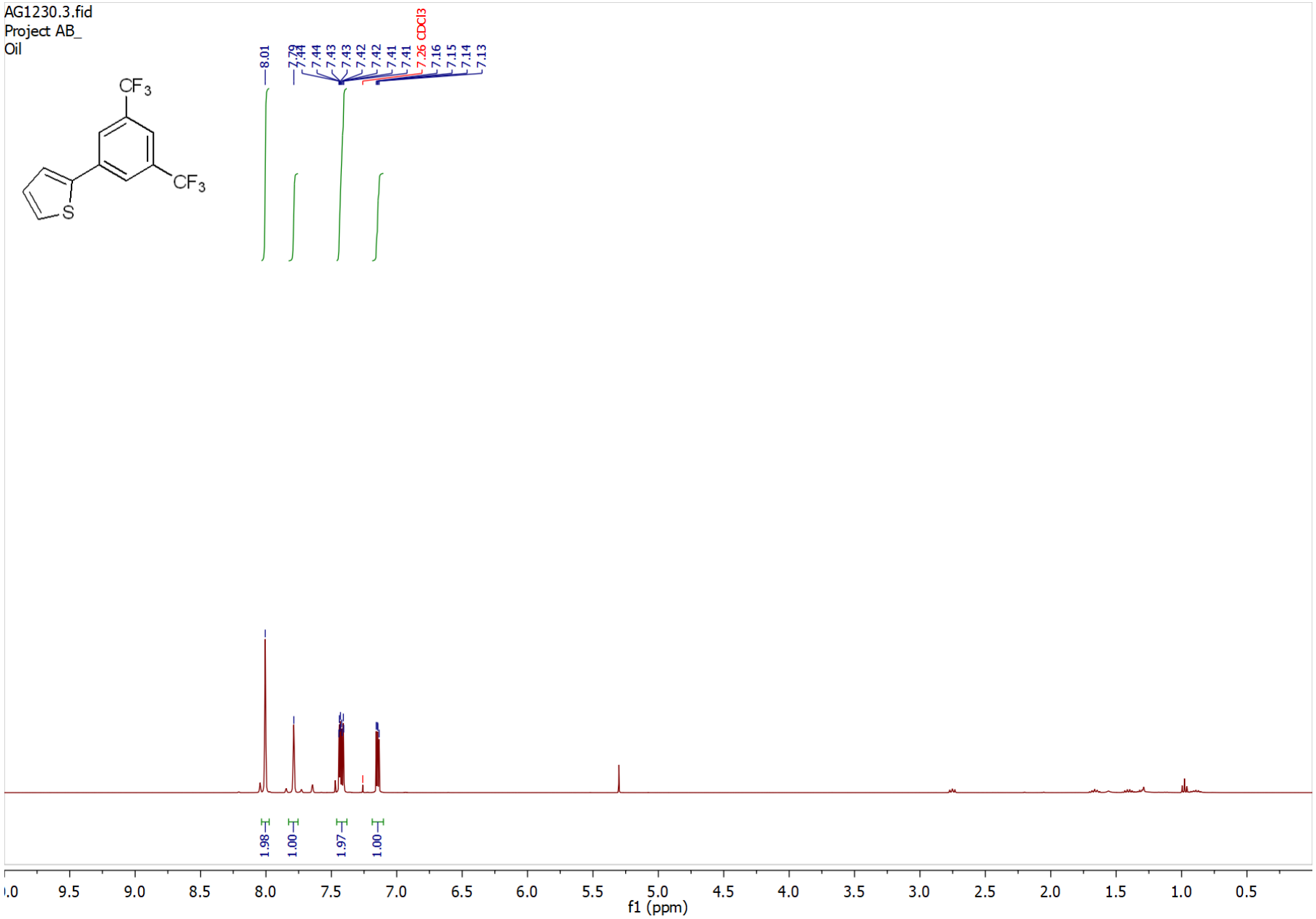
Compound 5d


AG1197.2.fid
Project AB_
Oil
-62.94
-62.95
-62.97
-62.98
CF3
CF3
Cl
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

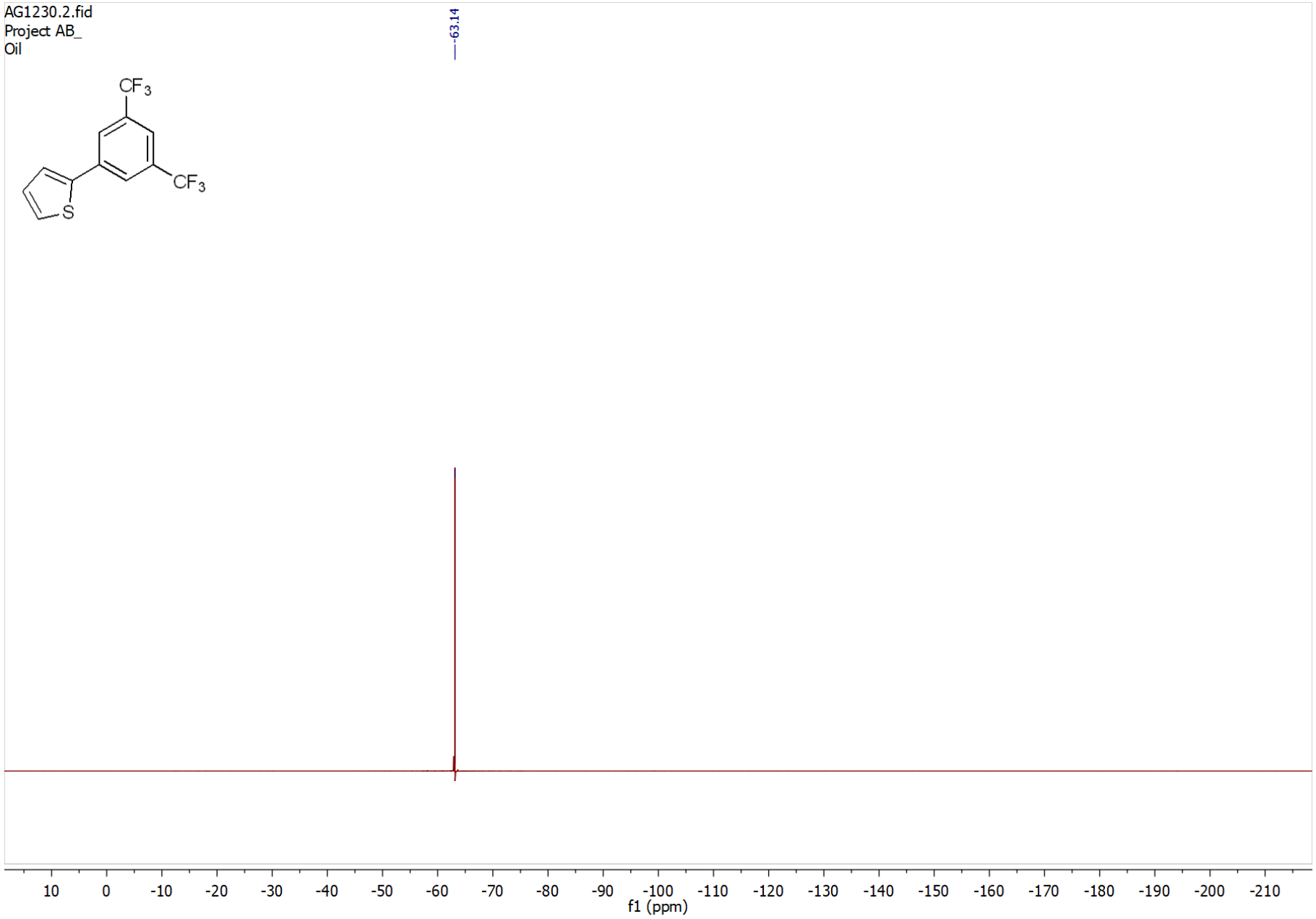
Compound 5d


AG1197.7.fid
Project AB_
Oil
142.28
136.84
135.49
133.03
132.70
132.37
132.04
129.70
128.67
127.57
127.28
127.24
127.20
127.16
124.86
122.15
121.56
121.52
121.48
121.44
121.41
121.37
121.33
119.44
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
Cl
f1 (ppm)

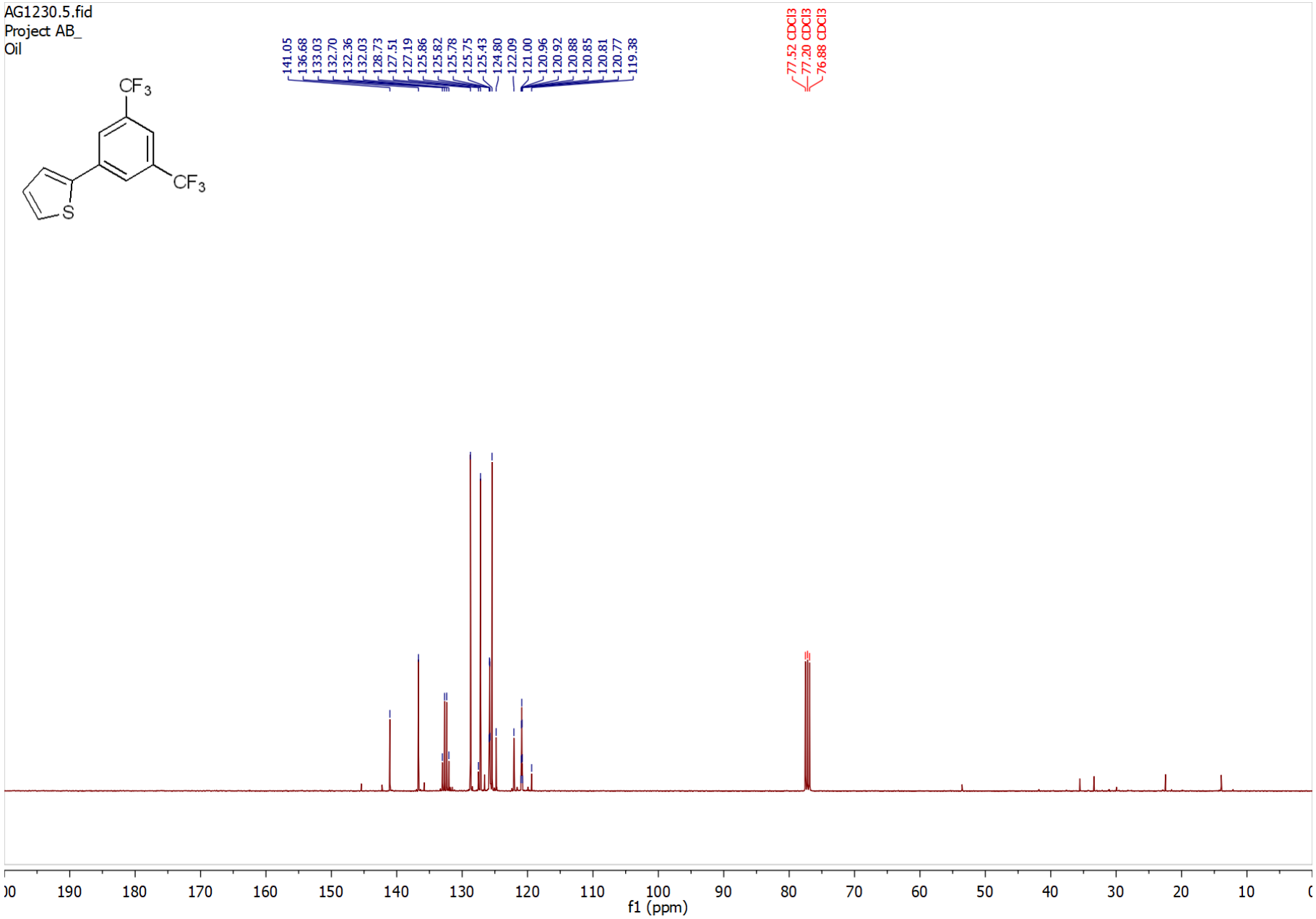
Compound 5e


AG1230.3.fid
Project AB_
Oil
CF3
CF3
S
8.01
7.79
7.44
7.44
7.43
7.43
7.42
7.42
7.41
7.41
7.26 CDCl3
7.16
7.15
7.14
7.13
1.98
1.00
1.97
1.00
f1 (ppm)

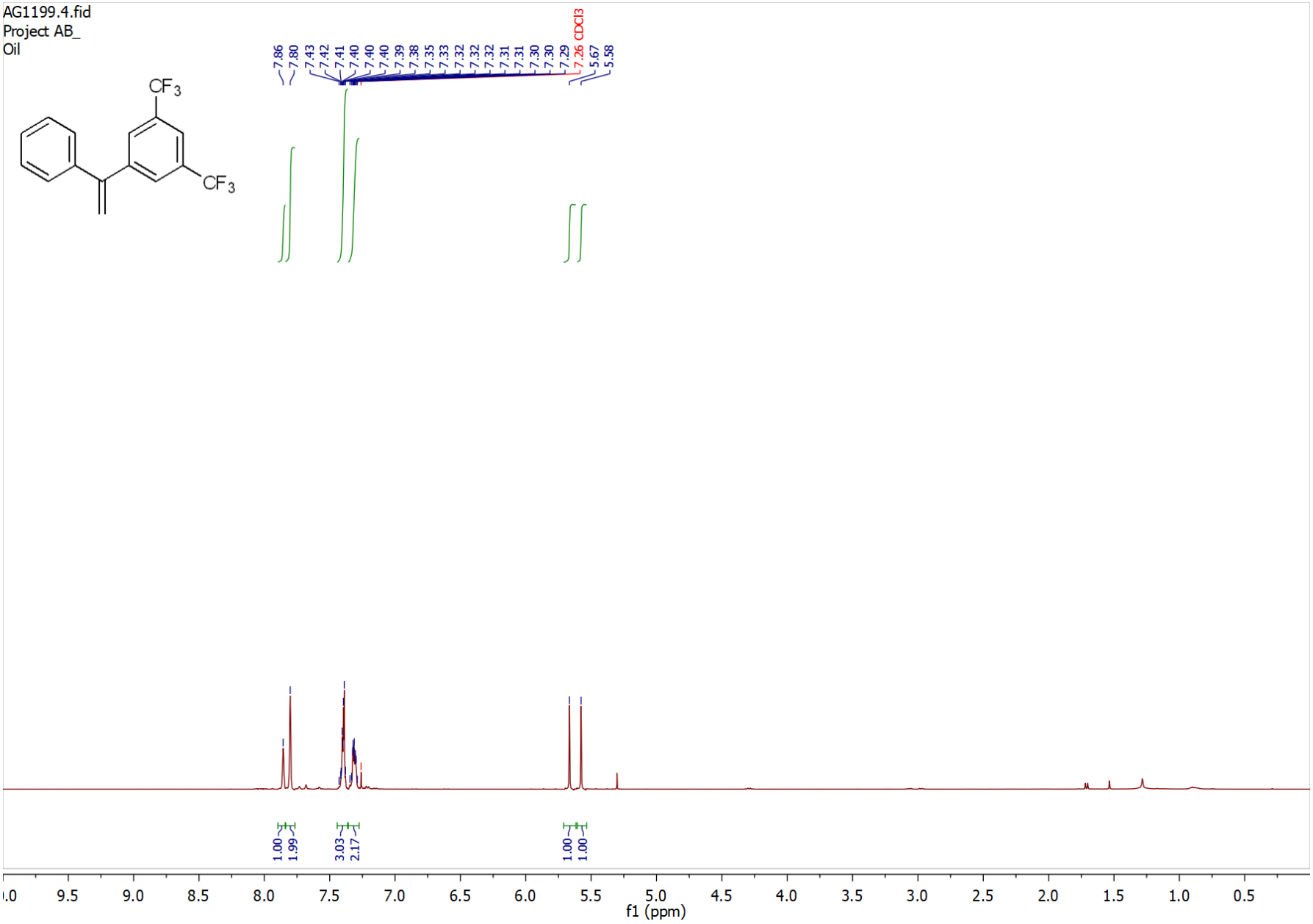
Compound 5e


AG1230.2.fid
Project AB_
Oil
63.14
CF3
CF3
S
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

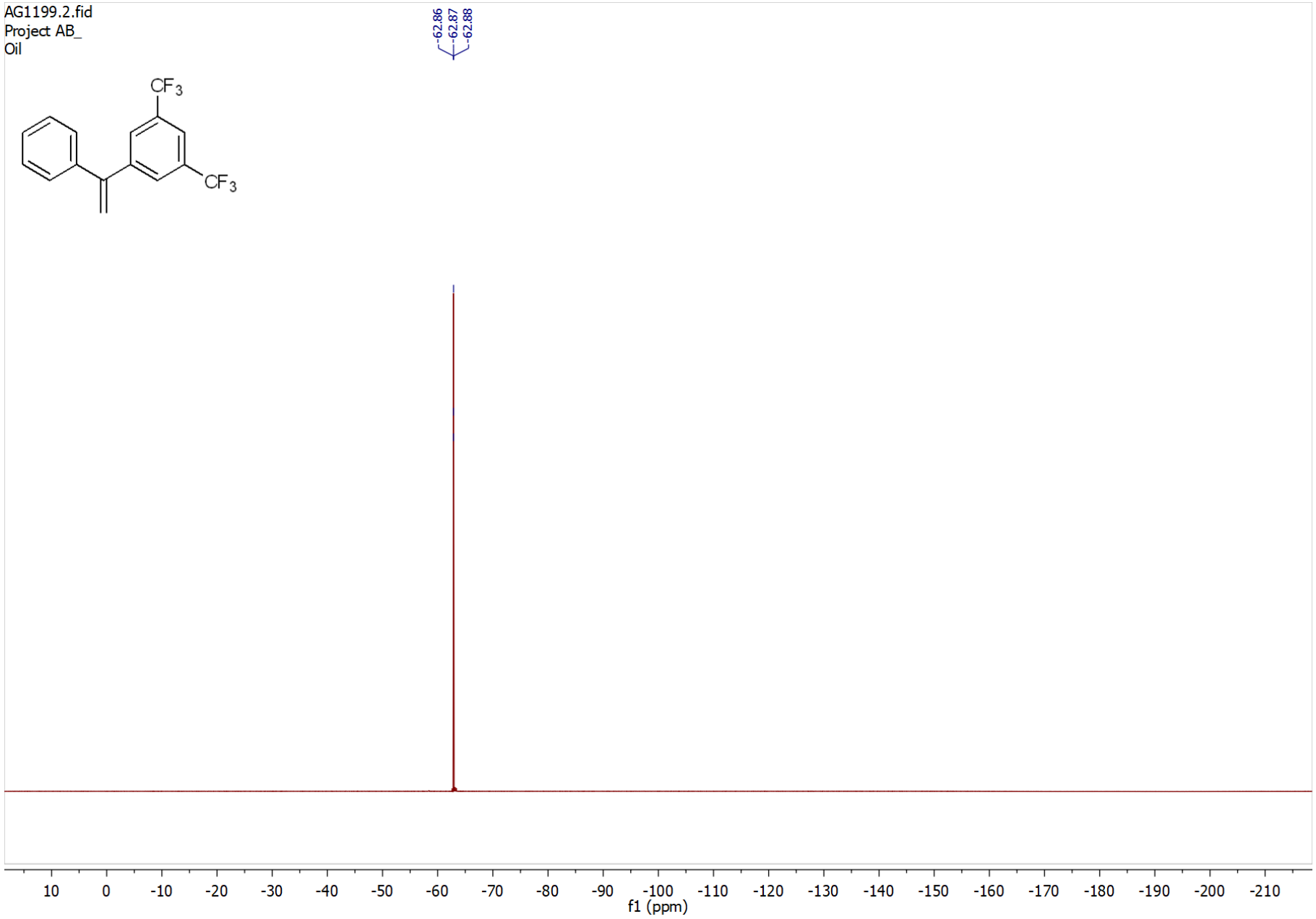
Compound 5e


AG1230.5.fid
Project AB_
Oil
141.05
136.68
133.03
132.70
132.36
132.03
128.73
127.51
127.19
125.86
125.82
125.78
125.75
125.43
124.80
122.09
121.00
120.96
120.92
120.88
120.85
120.81
120.77
119.38
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
S
f1 (ppm)

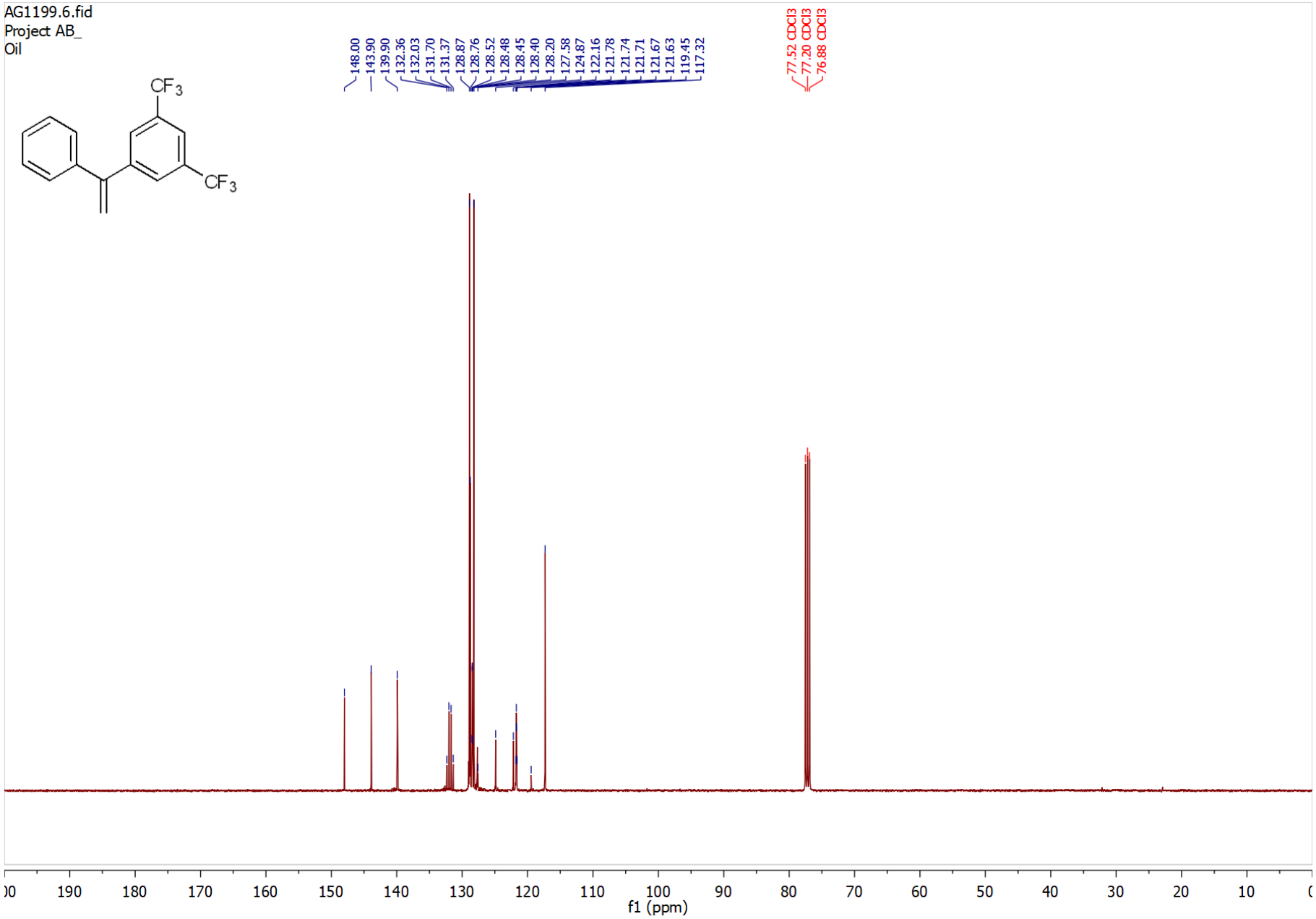
Compound 5f


AG1199.4.fid
Project AB_
Oil
CF3
CF3
7.86
7.80
7.43
7.42
7.41
7.40
7.40
7.40
7.39
7.38
7.35
7.33
7.32
7.32
7.32
7.31
7.31
7.30
7.30
7.29
7.26 CDCl3
5.67
5.58
1.00
1.99
3.03
2.17
1.00
1.00
f1 (ppm)

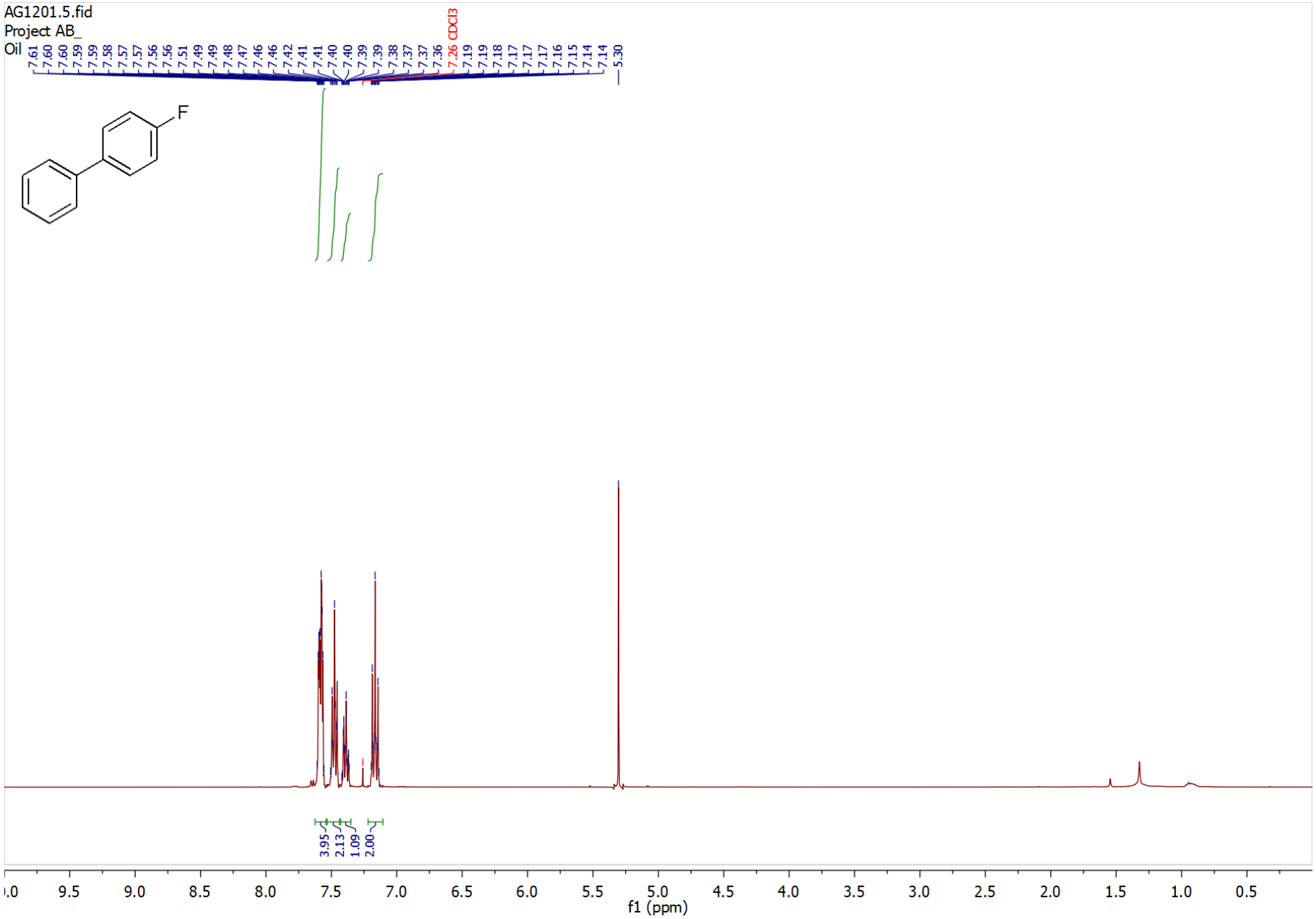
Compound 5f


AG1199.2.fid
Project AB_
Oil
-62.86
-62.87
-62.88
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

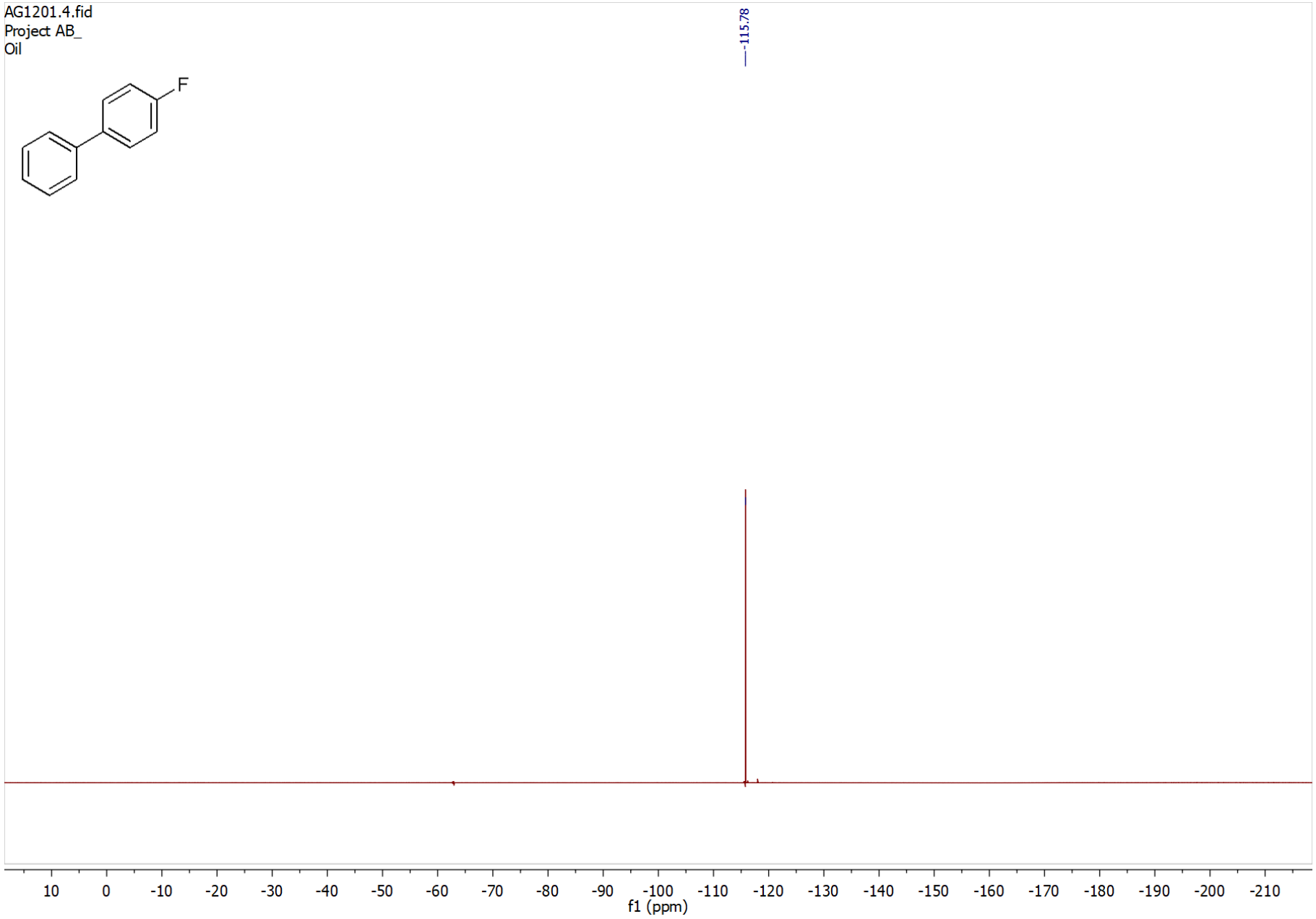
Compound 5f


AG1199.6.fid
Project AB_
Oil
148.00
143.90
139.90
132.36
132.03
131.70
131.37
128.87
128.76
128.52
128.48
128.45
128.40
128.20
127.58
124.87
122.16
121.78
121.74
121.71
121.67
121.63
119.45
117.32
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
f1 (ppm)

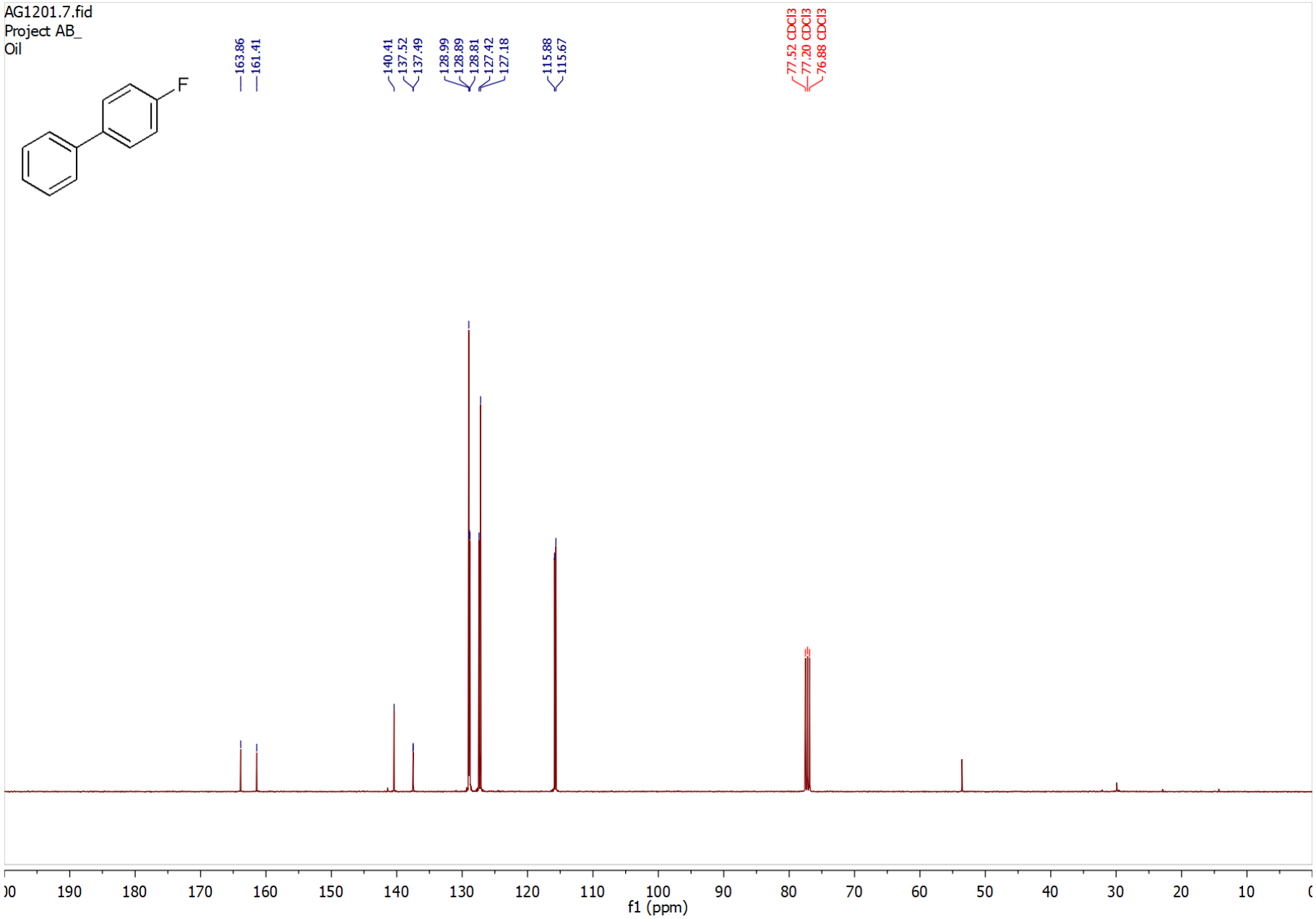
Compound 5h


AG1201.5.fid
Project AB_
Oil
7.61 7.60 7.60 7.59 7.59 7.58 7.57 7.57 7.56 7.56 7.51 7.49 7.49 7.48 7.47 7.46 7.46 7.42 7.41 7.41 7.40 7.40 7.39 7.39 7.38 7.37 7.37 7.36 7.26 CDCl3 7.19 7.19 7.18 7.17 7.17 7.17 7.16 7.15 7.14 7.14 5.30
F
3.95
2.13
1.09
2.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
f1 (ppm)

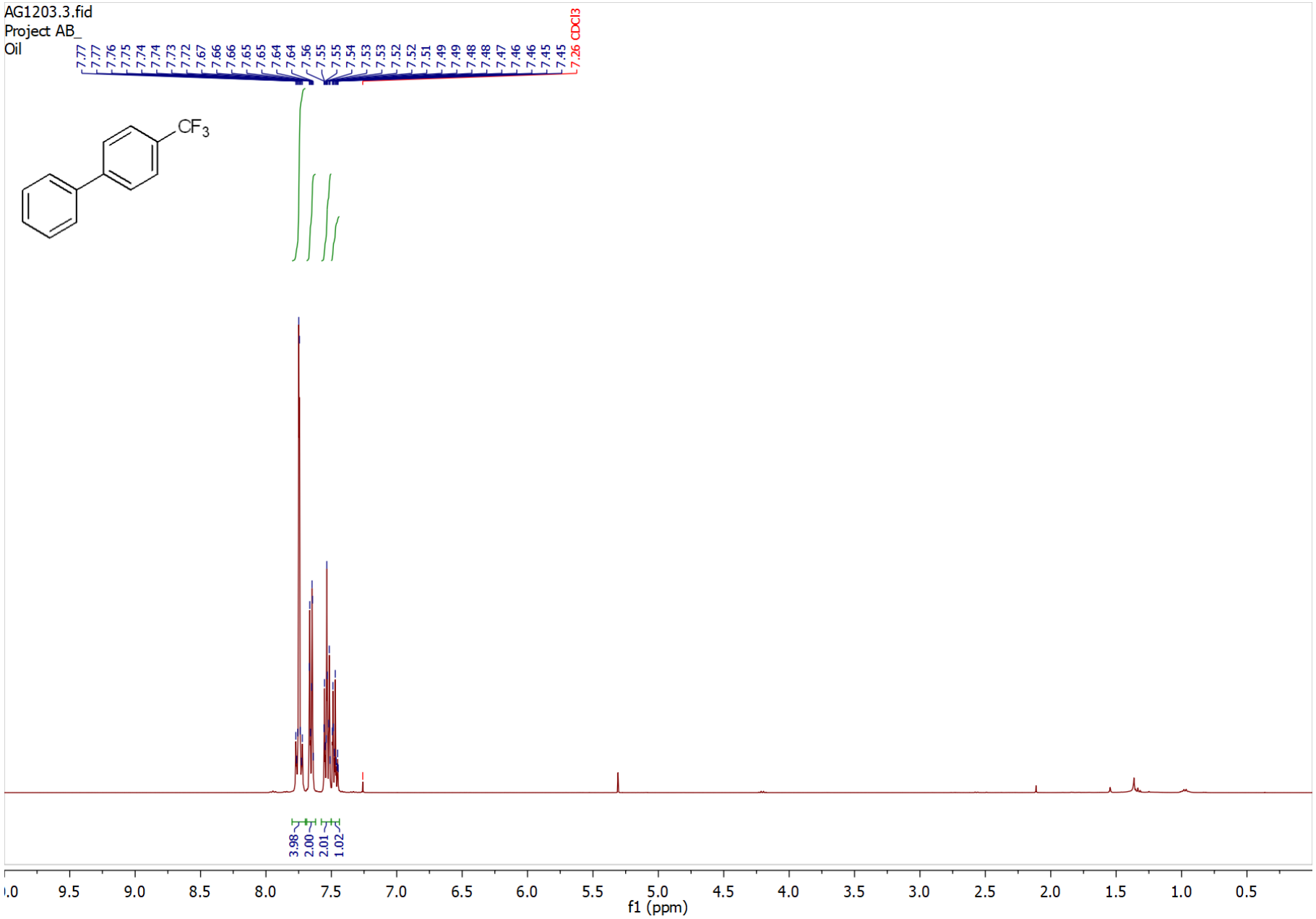
Compound 5h


AG1201.4.fid
Project AB_
Oil
F
-115.78
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

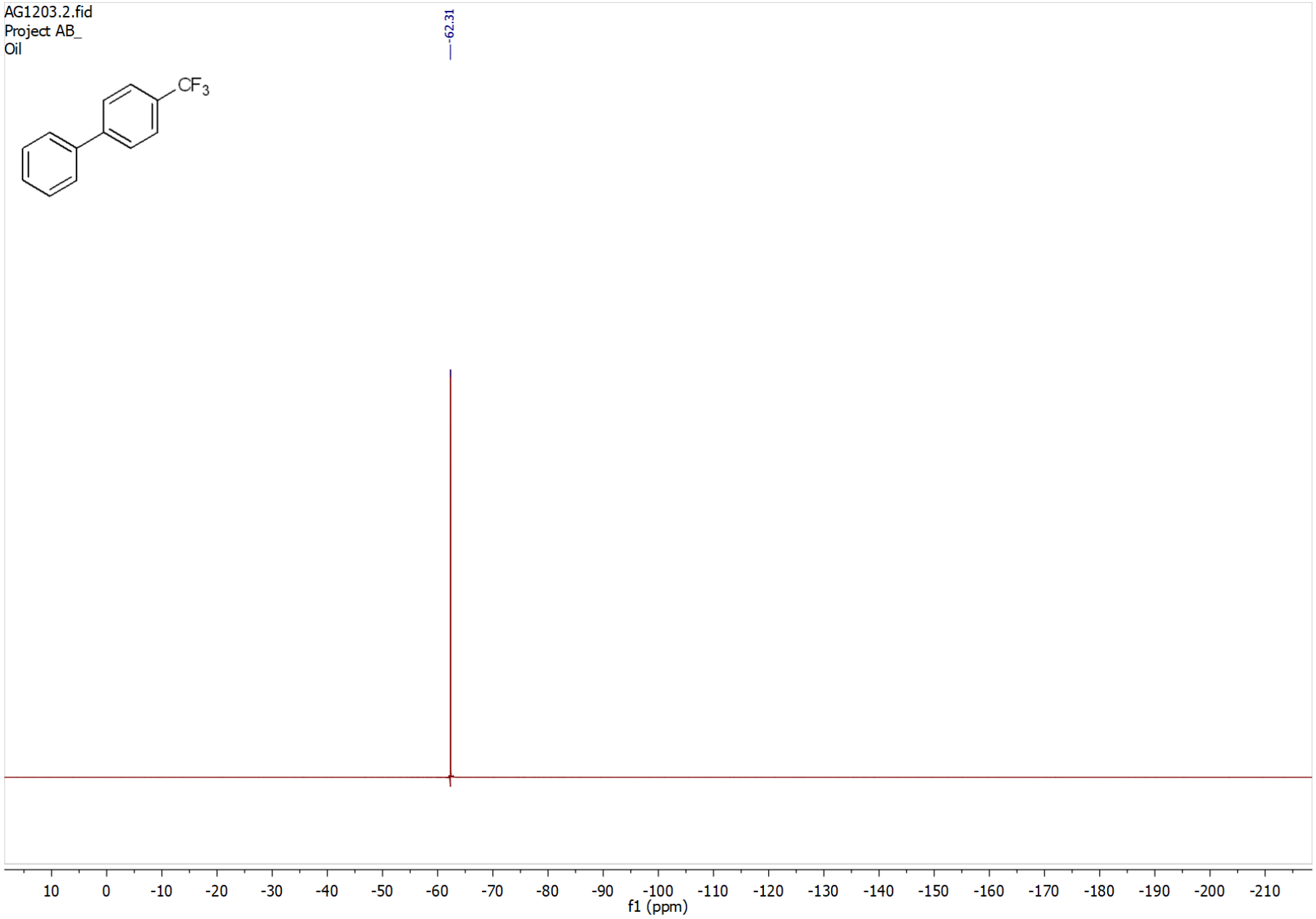
Compound 5h


AG1201.7.fid
Project AB_
Oil
F
163.86
161.41
140.41
137.52
137.49
128.99
128.89
128.81
127.42
127.18
115.88
115.67
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

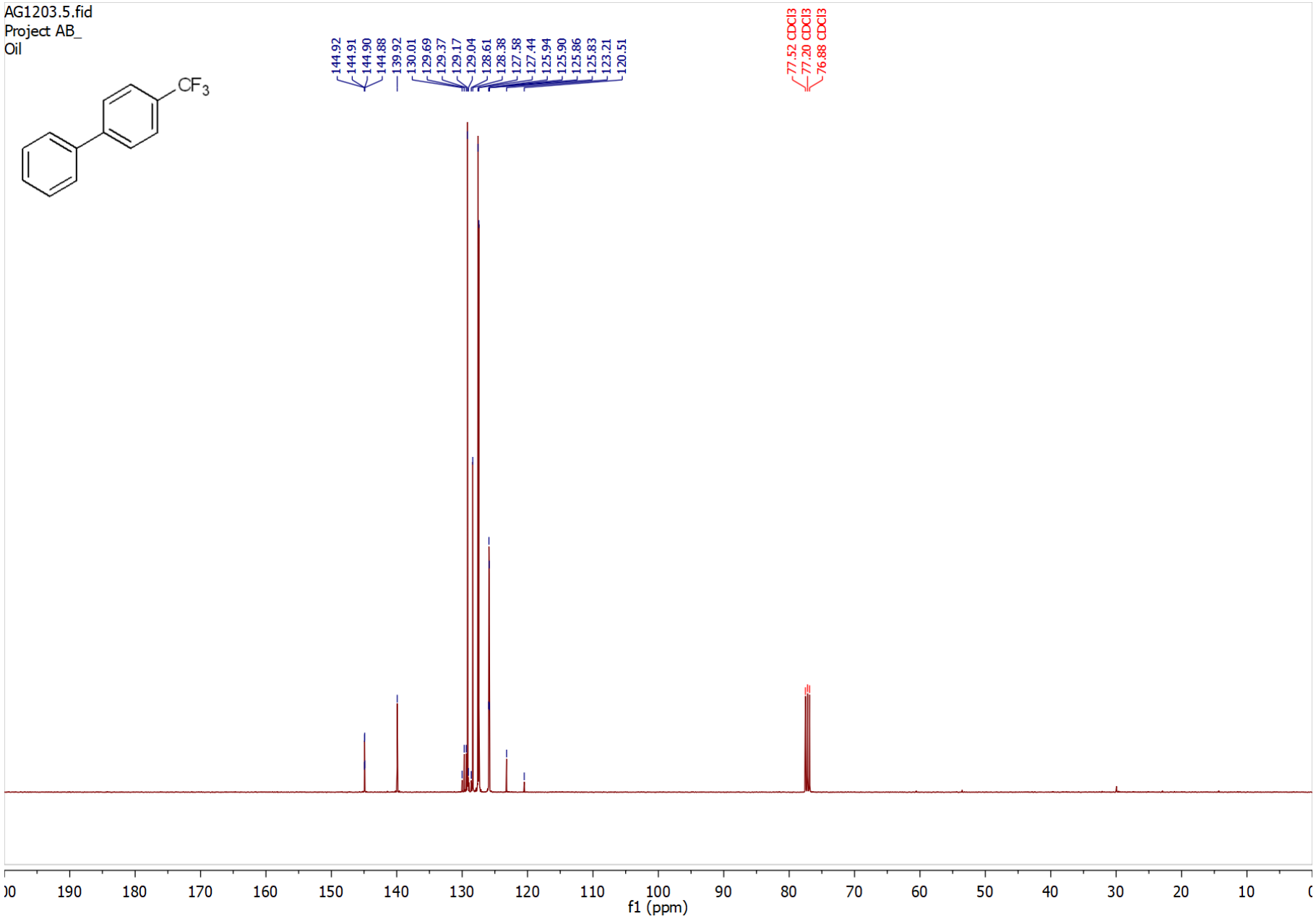
Compound 5i


AG1203.3.fid
Project AB_
Oil
7.77
7.77
7.76
7.75
7.74
7.74
7.73
7.72
7.67
7.66
7.66
7.65
7.65
7.64
7.64
7.56
7.55
7.55
7.54
7.53
7.53
7.52
7.52
7.51
7.49
7.49
7.48
7.48
7.47
7.46
7.46
7.45
7.45
7.26 CDCl3
CF3
3.98
2.00
2.01
1.02
f1 (ppm)

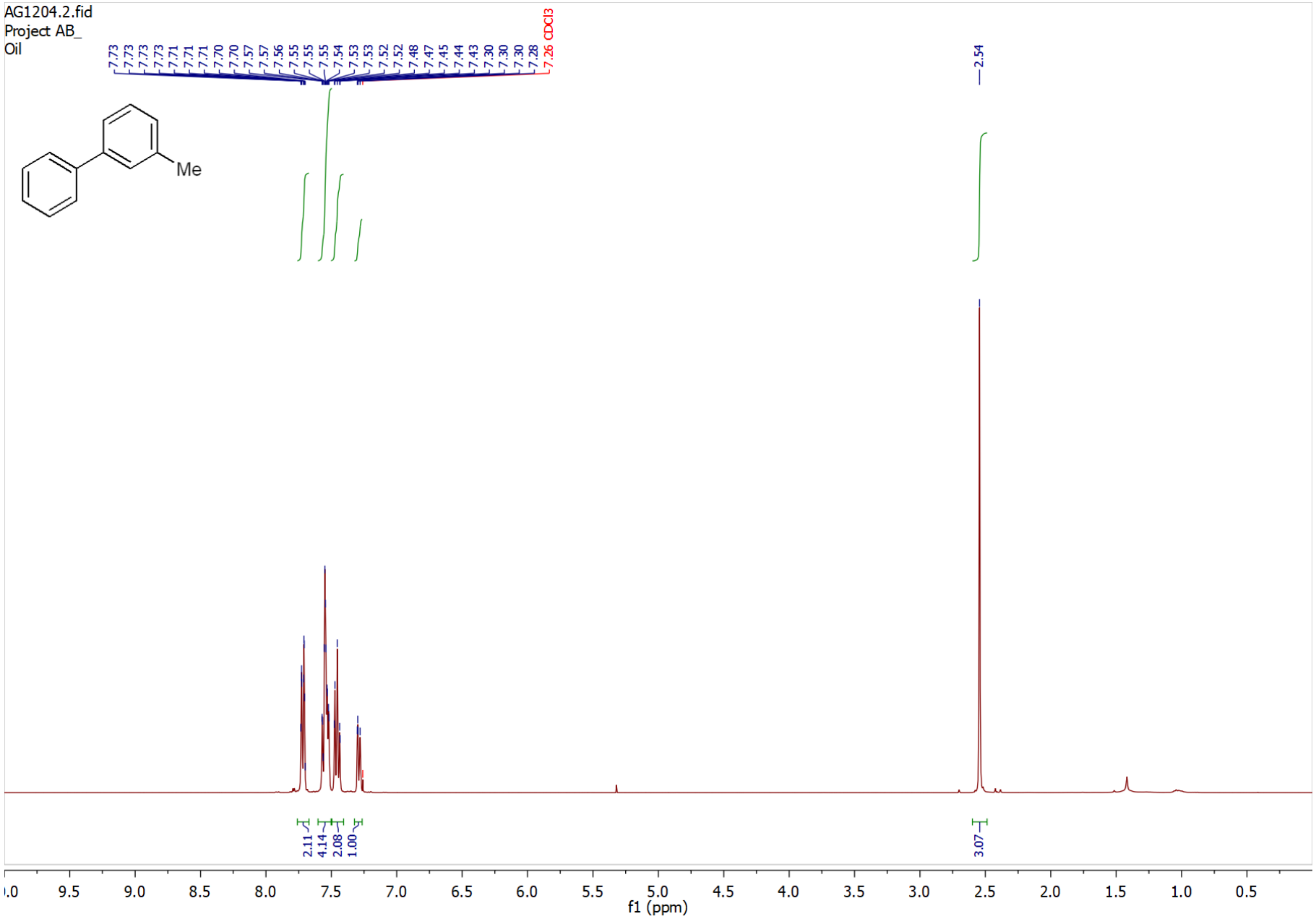
Compound 5i


AG1203.2.fid
Project AB_
Oil
-62.31
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

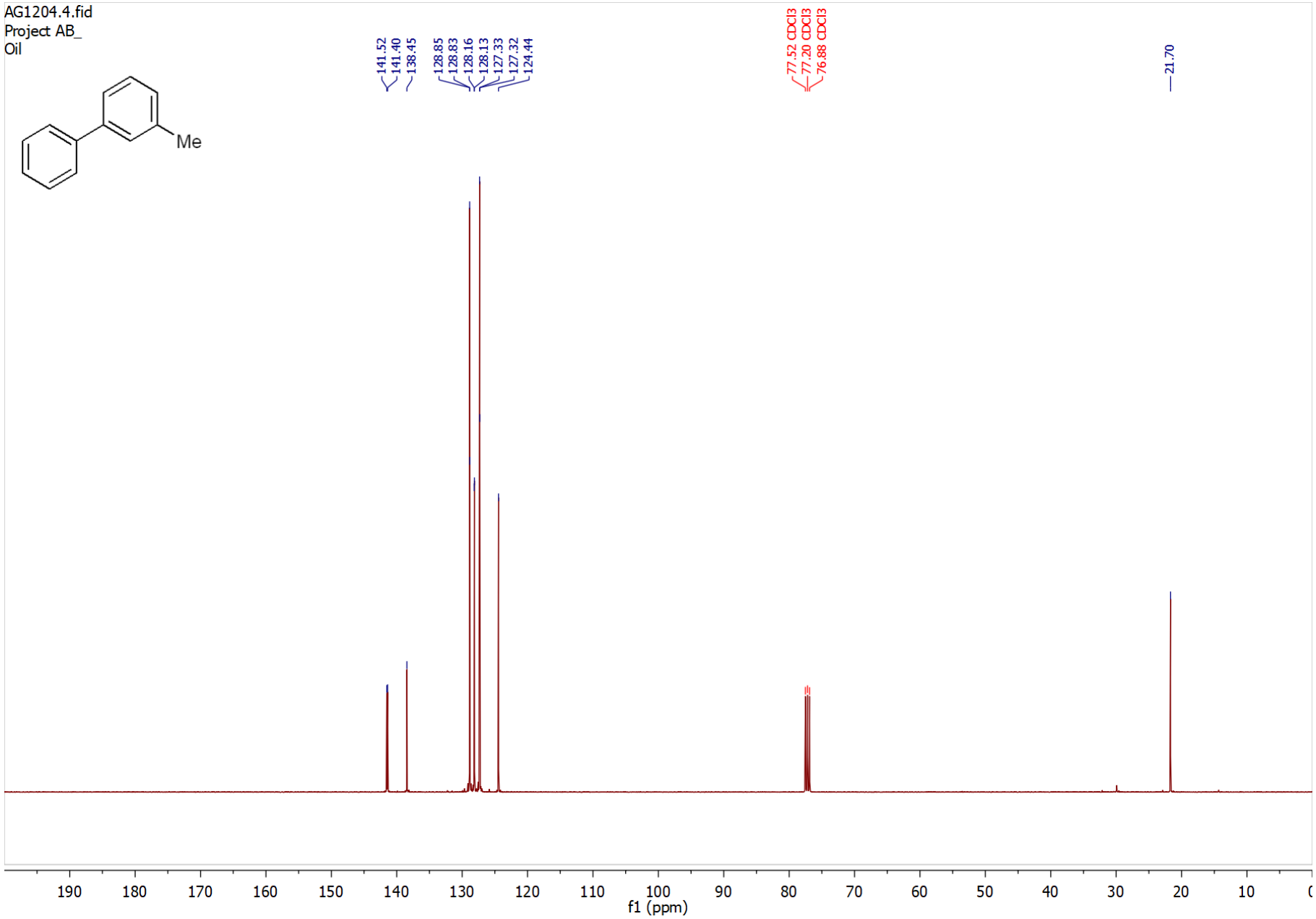
Compound 5i


AG1203.5.fid
Project AB_
Oil
CF3
144.92
144.91
144.90
144.88
139.92
130.01
129.69
129.37
129.17
129.04
128.61
128.38
127.58
127.44
125.94
125.90
125.86
125.83
123.21
120.51
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

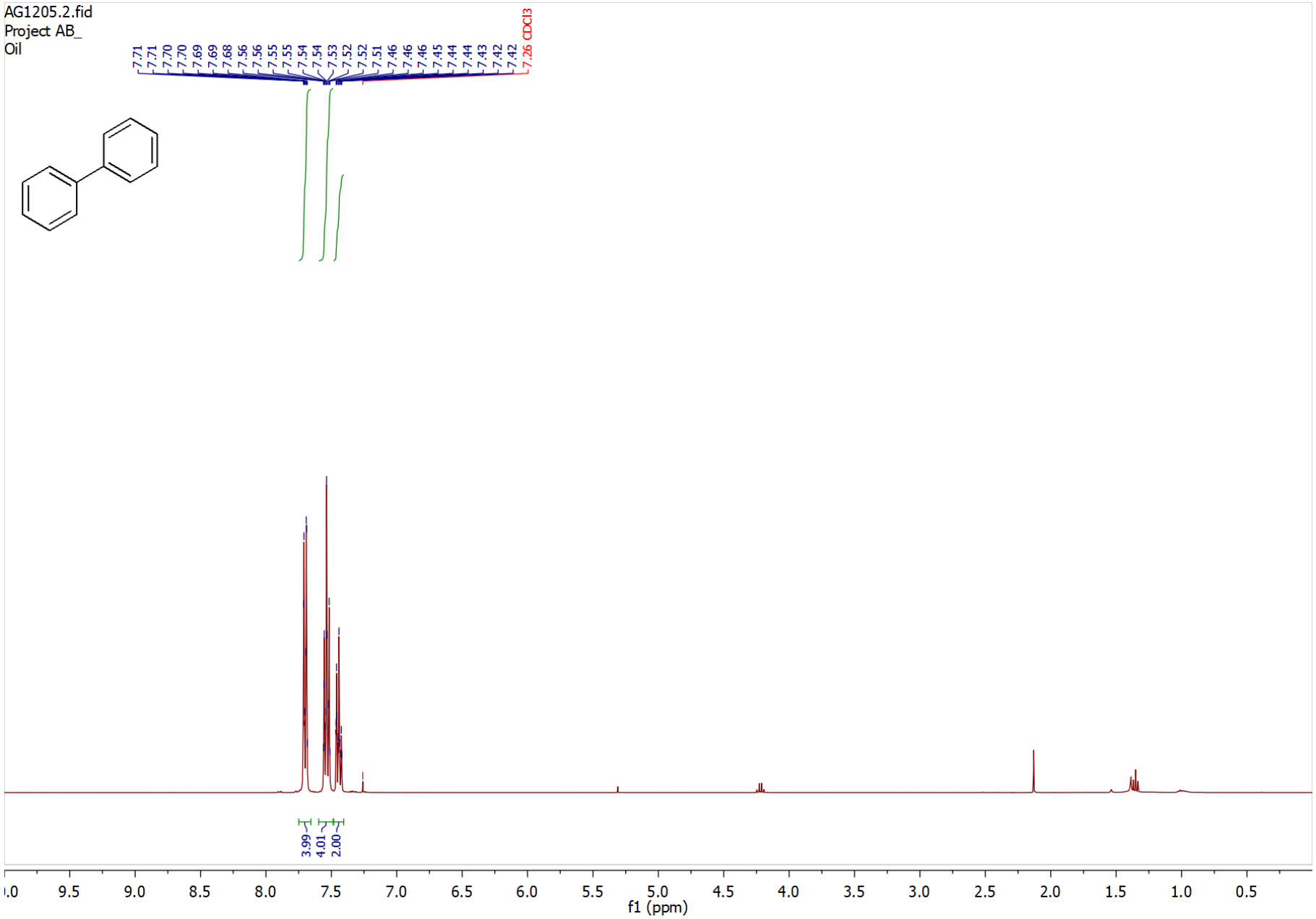
Compound 5j


AG1204.2.fid
Project AB_
Oil
7.73
7.73
7.73
7.73
7.71
7.71
7.71
7.70
7.70
7.57
7.57
7.56
7.55
7.55
7.55
7.54
7.53
7.53
7.52
7.52
7.48
7.47
7.45
7.44
7.43
7.30
7.30
7.30
7.28
7.26 CDCl3
2.54
Me
2.11
4.14
2.08
1.00
3.07
f1 (ppm)

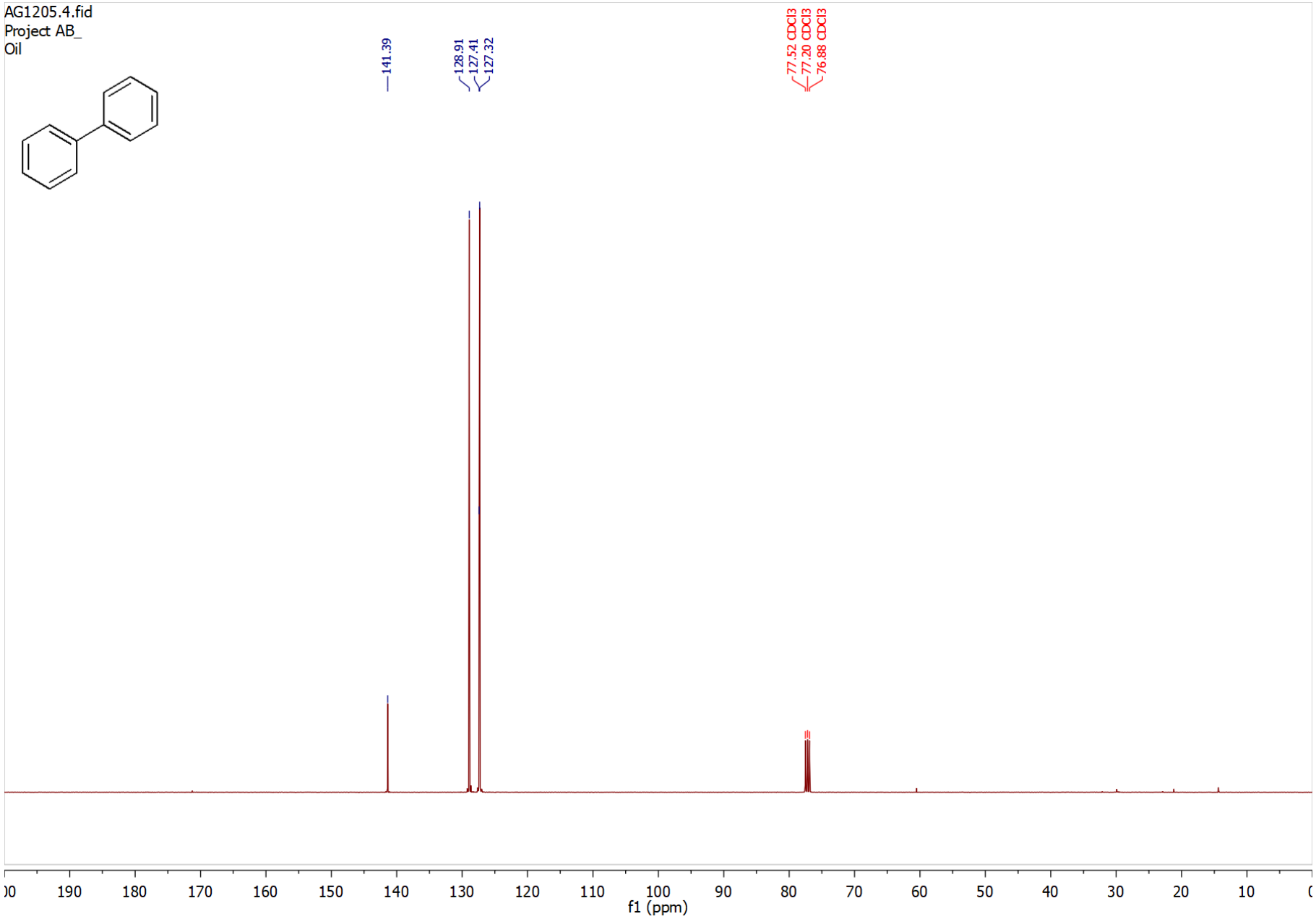
Compound 5j


AG1204.4.fid
Project AB_
Oil
Me
141.52
141.40
138.45
128.85
128.83
128.16
128.13
127.33
127.32
124.44
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.70
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

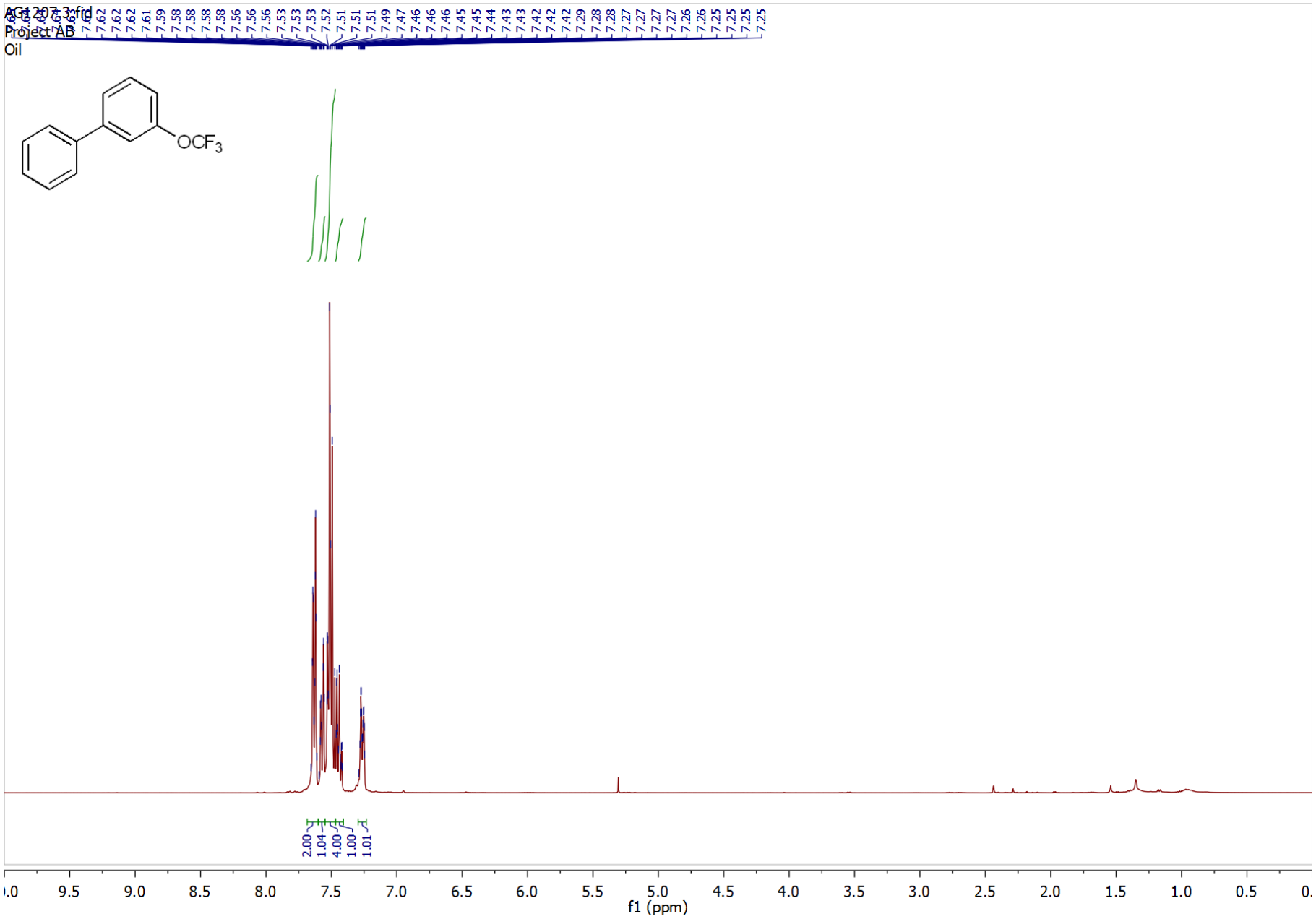
Compound 5k


AG1205.2.fid
Project AB_
Oil
7.71
7.71
7.70
7.70
7.69
7.69
7.68
7.56
7.56
7.55
7.55
7.54
7.54
7.53
7.52
7.52
7.51
7.46
7.46
7.46
7.45
7.44
7.44
7.43
7.42
7.42
7.26 CDCl3
3.99
4.01
2.00
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

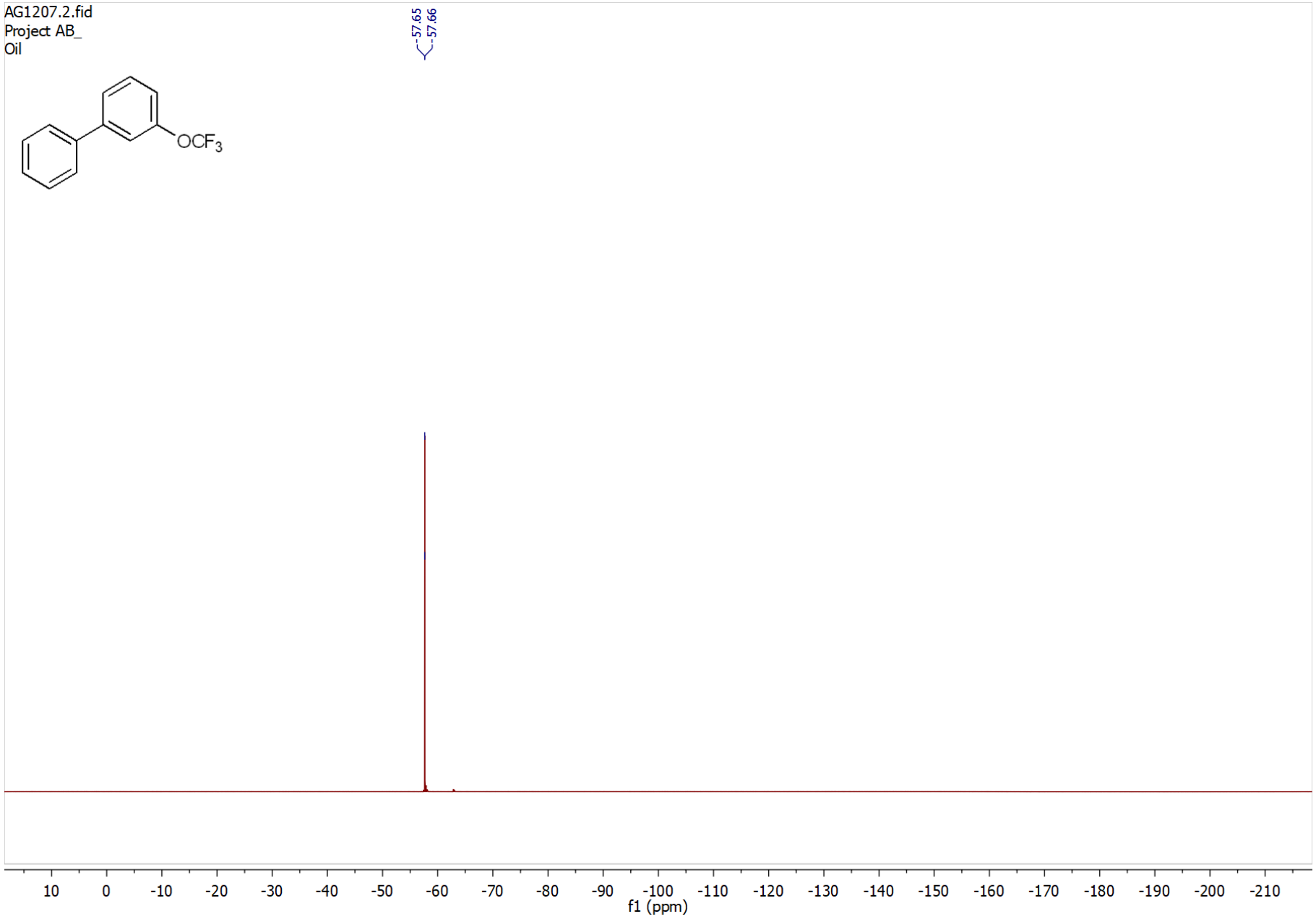
Compound 5k


AG1205.4.fid
Project AB_
Oil
141.39
128.91
127.41
127.32
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

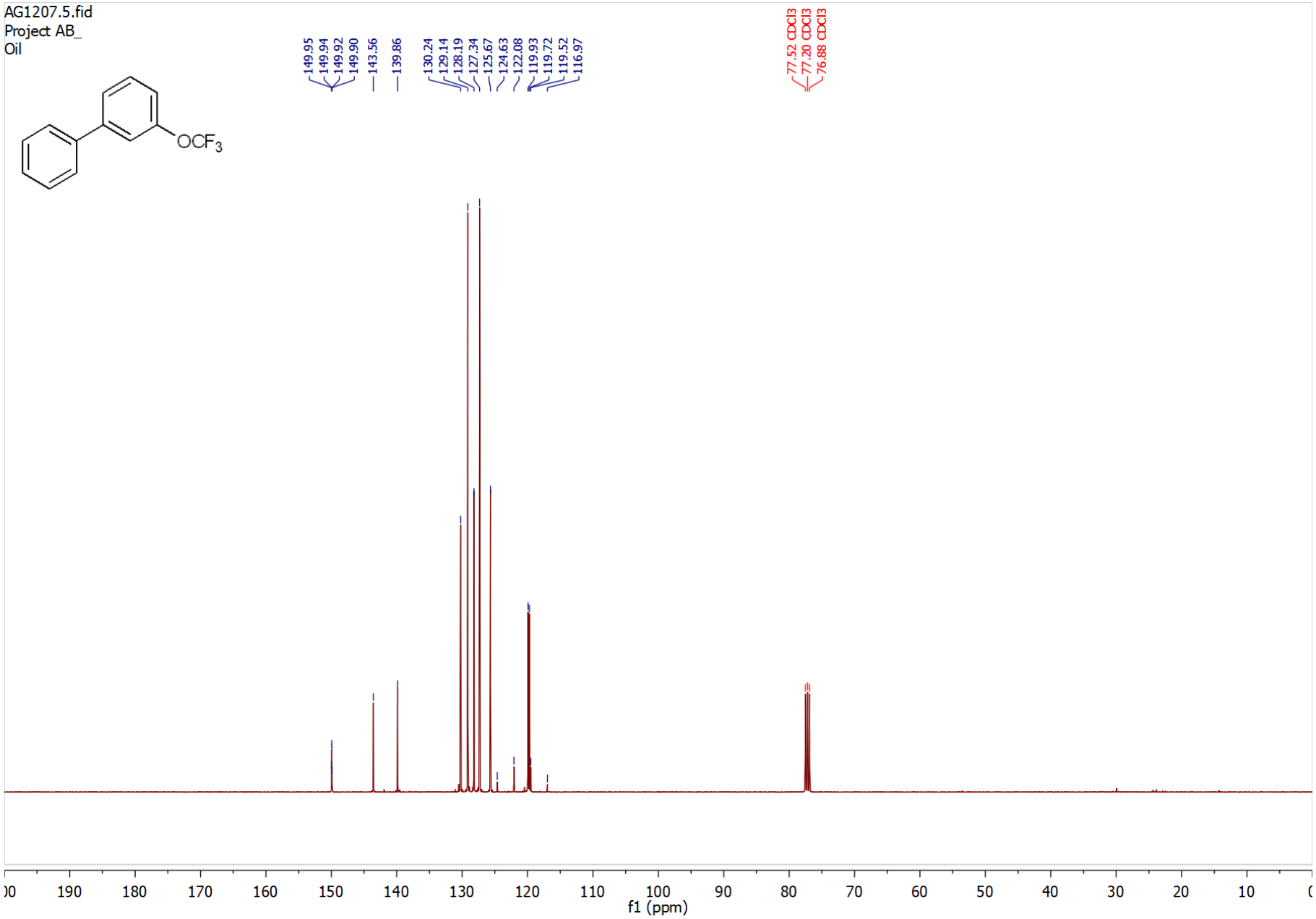
Compound 5l



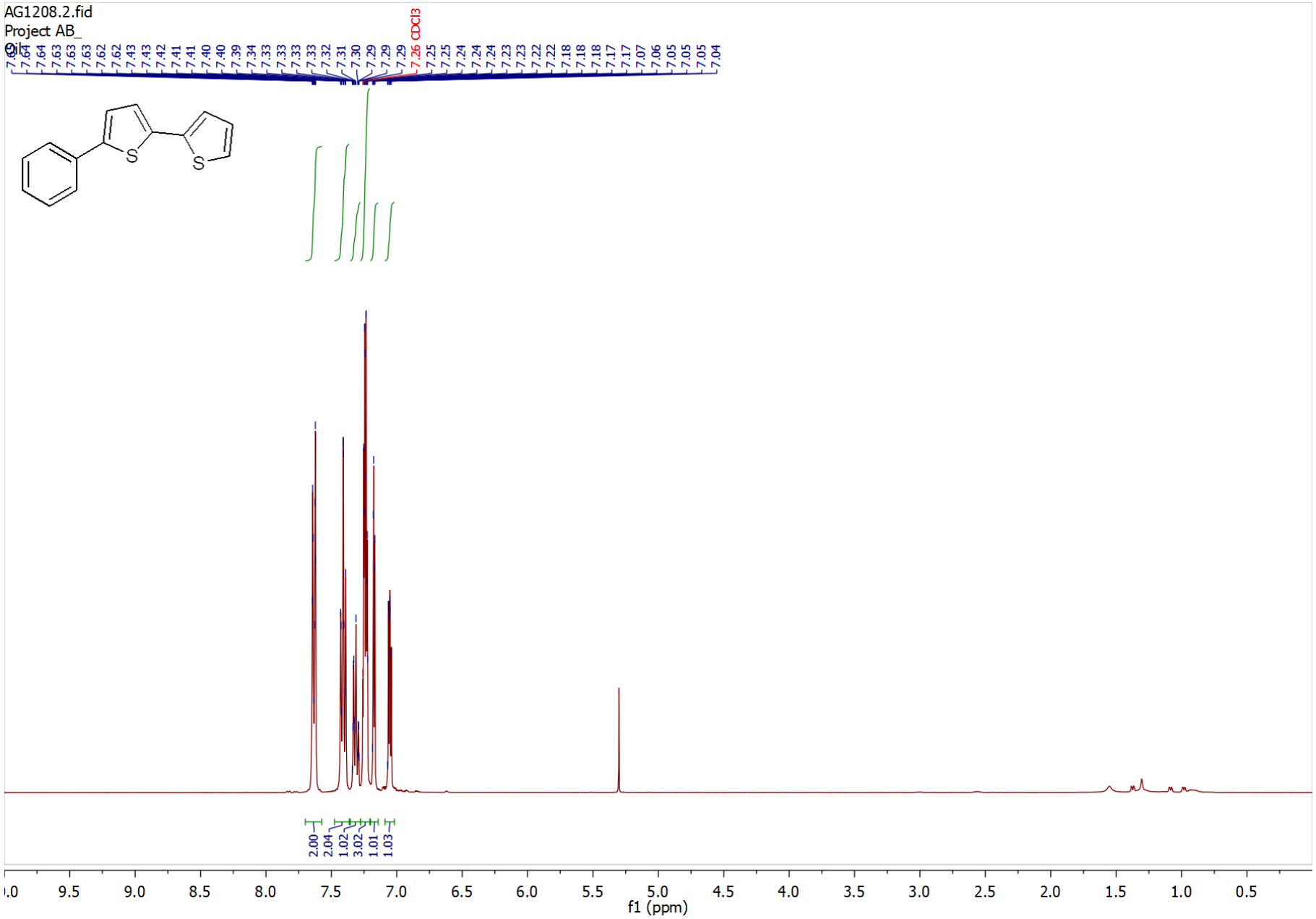
Compound 5l


AG1207.2.fid
Project AB_
Oil
-57.65
-57.66
OCF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

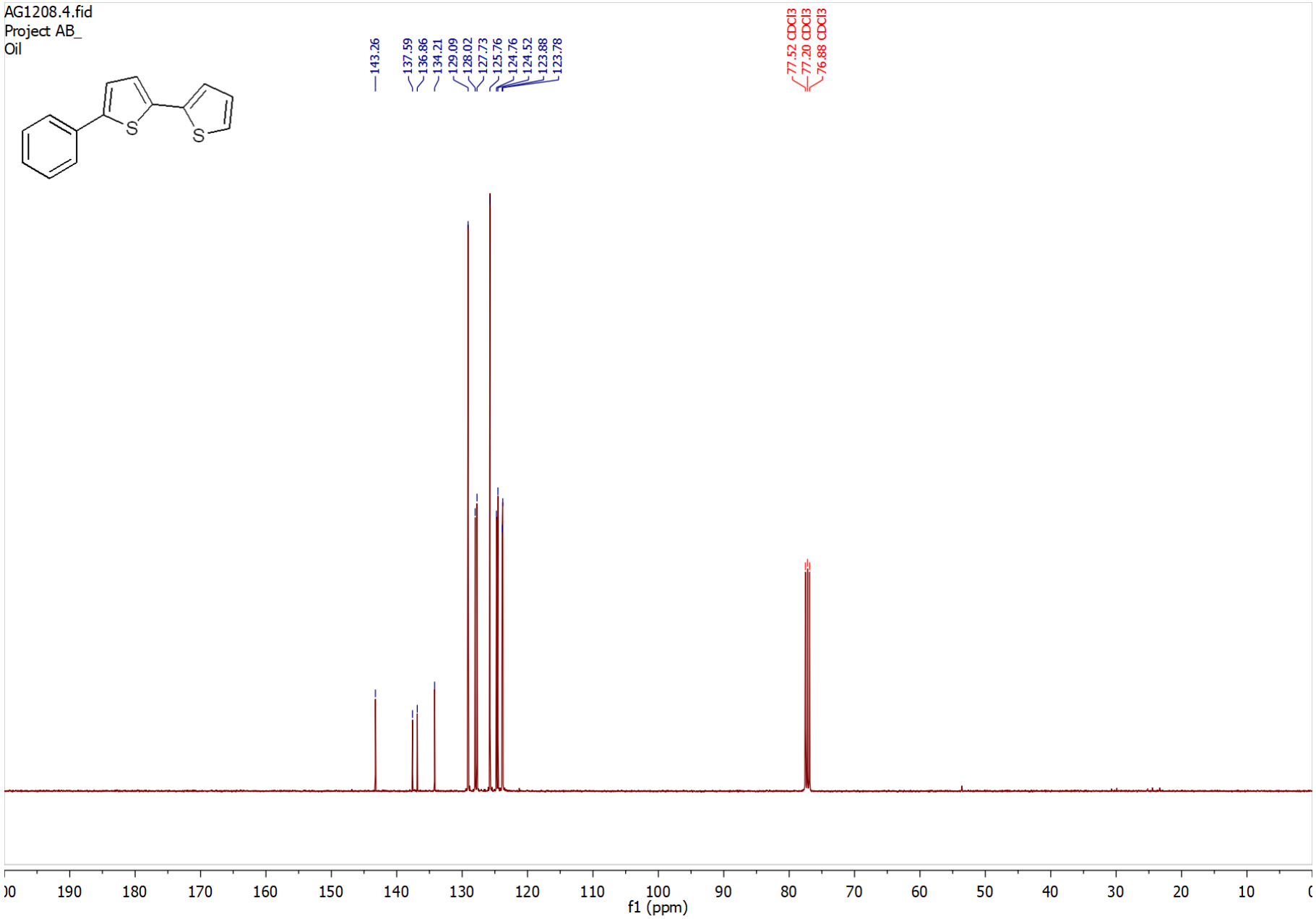
Compound 5l


AG1207.5.fid
Project AB_
Oil
149.95
149.94
149.92
149.90
143.56
139.86
130.24
129.14
128.19
127.34
125.67
124.63
122.08
119.93
119.72
119.52
116.97
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
OCF3
f1 (ppm)

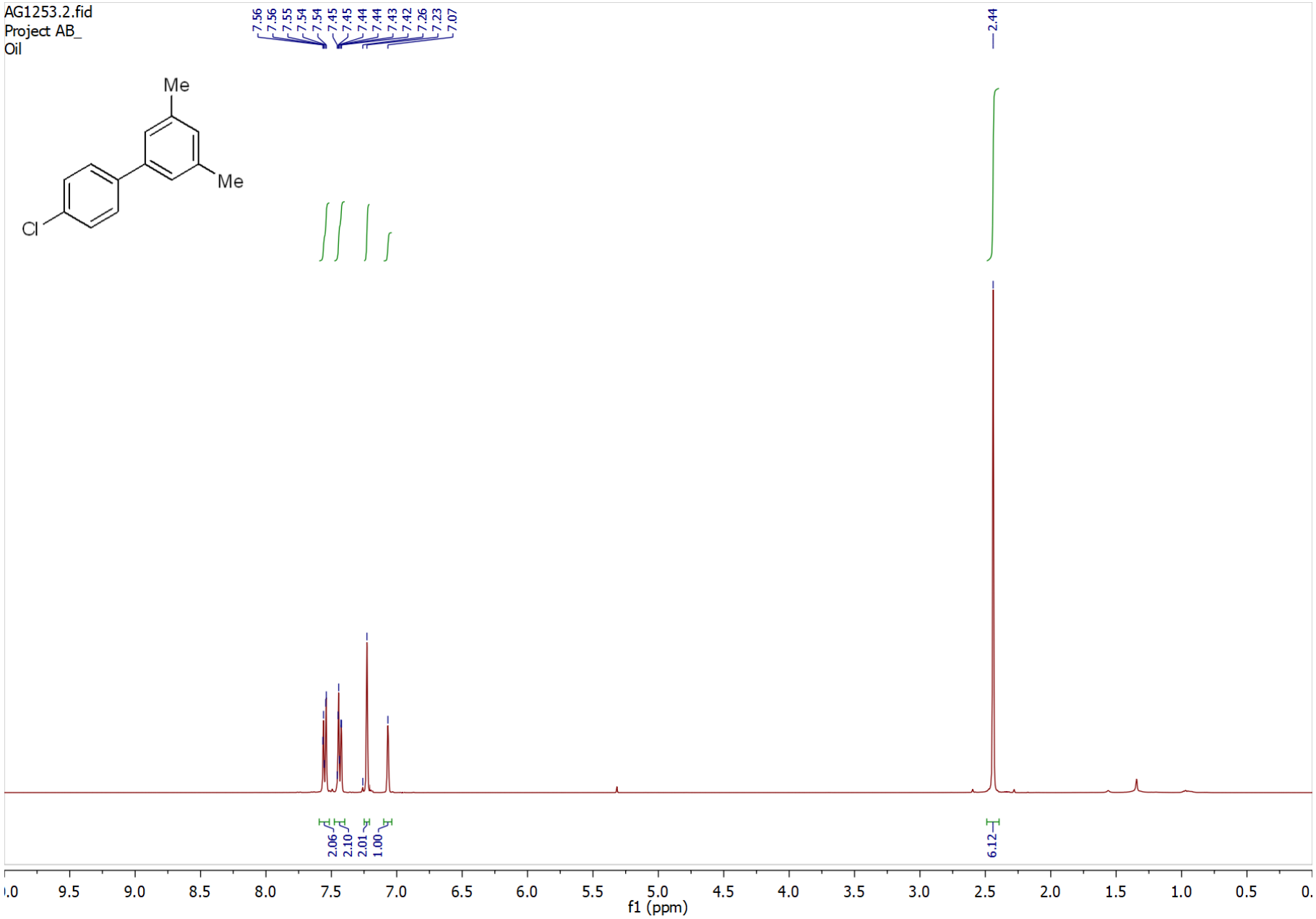
Compound 5m



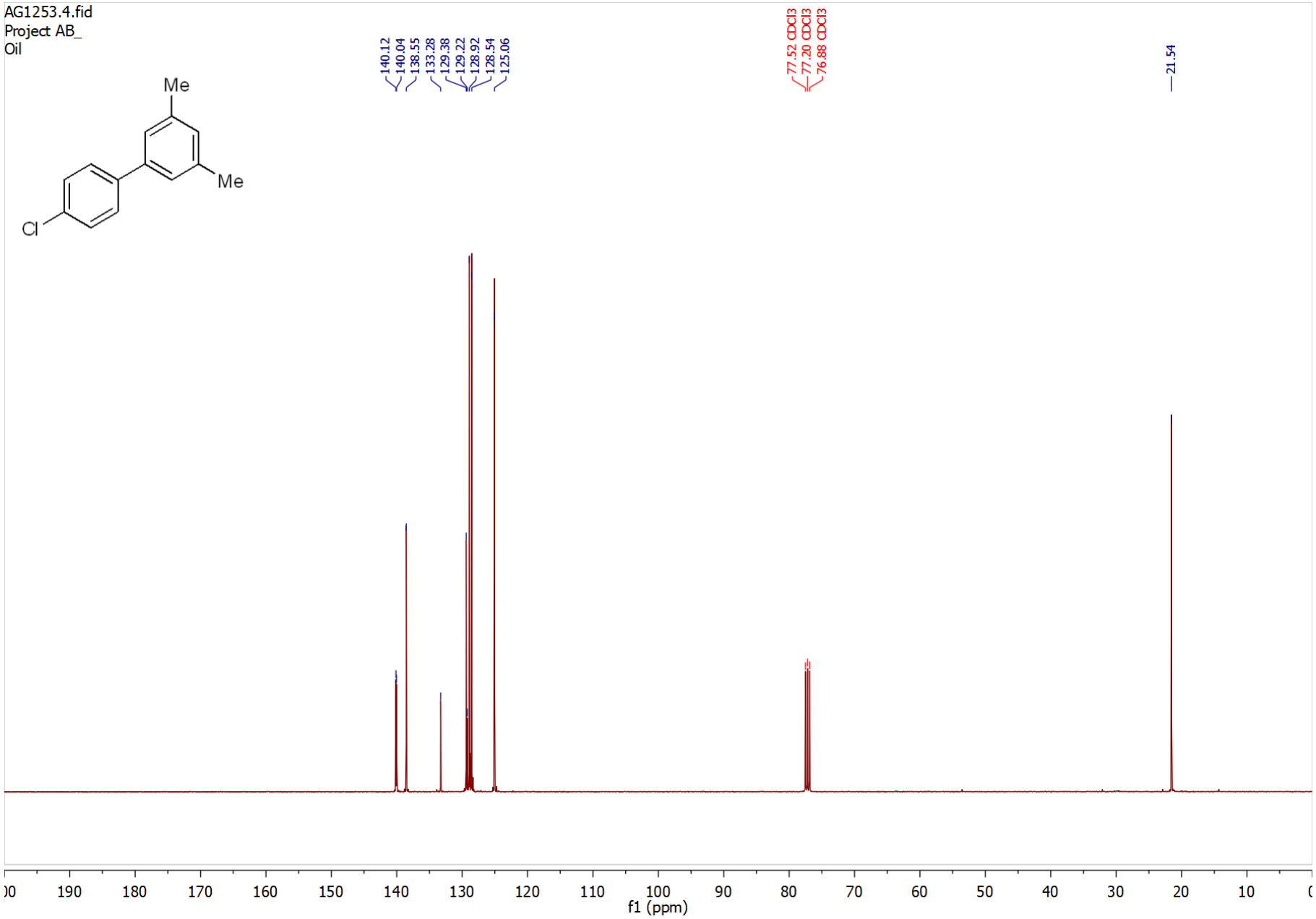
Compound 5m


AG1208.4.fid
Project AB_
Oil
143.26
137.59
136.86
134.21
129.09
128.02
127.73
125.76
124.76
124.52
123.88
123.78
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
S
S
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

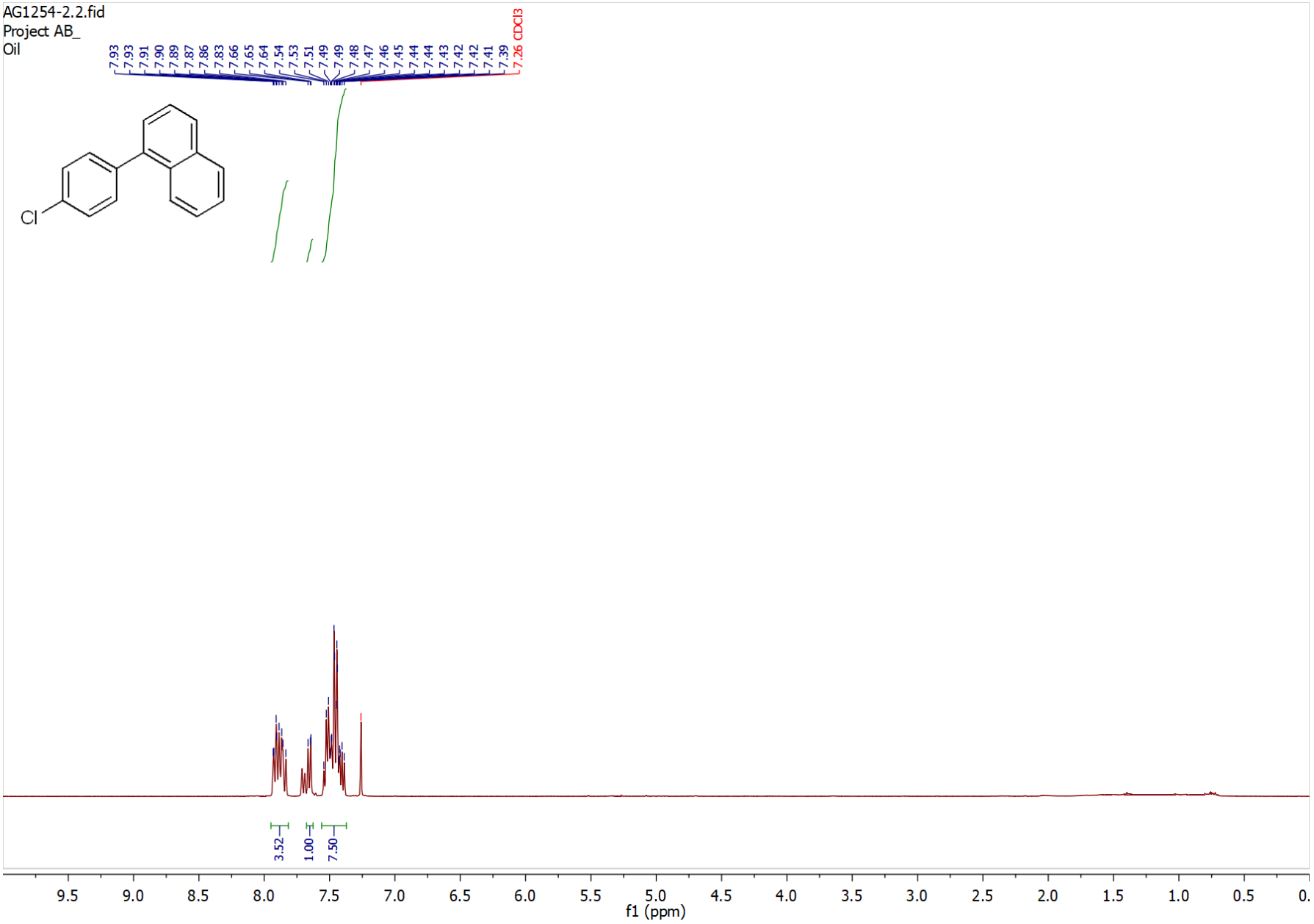
Compound 5n


AG1253.2.fid
Project AB_
Oil
7.56
7.56
7.55
7.54
7.54
7.45
7.45
7.44
7.44
7.43
7.42
7.26
7.23
7.07
2.44
Me
Me
Cl
2.06
2.10
2.01
1.00
6.12
f1 (ppm)

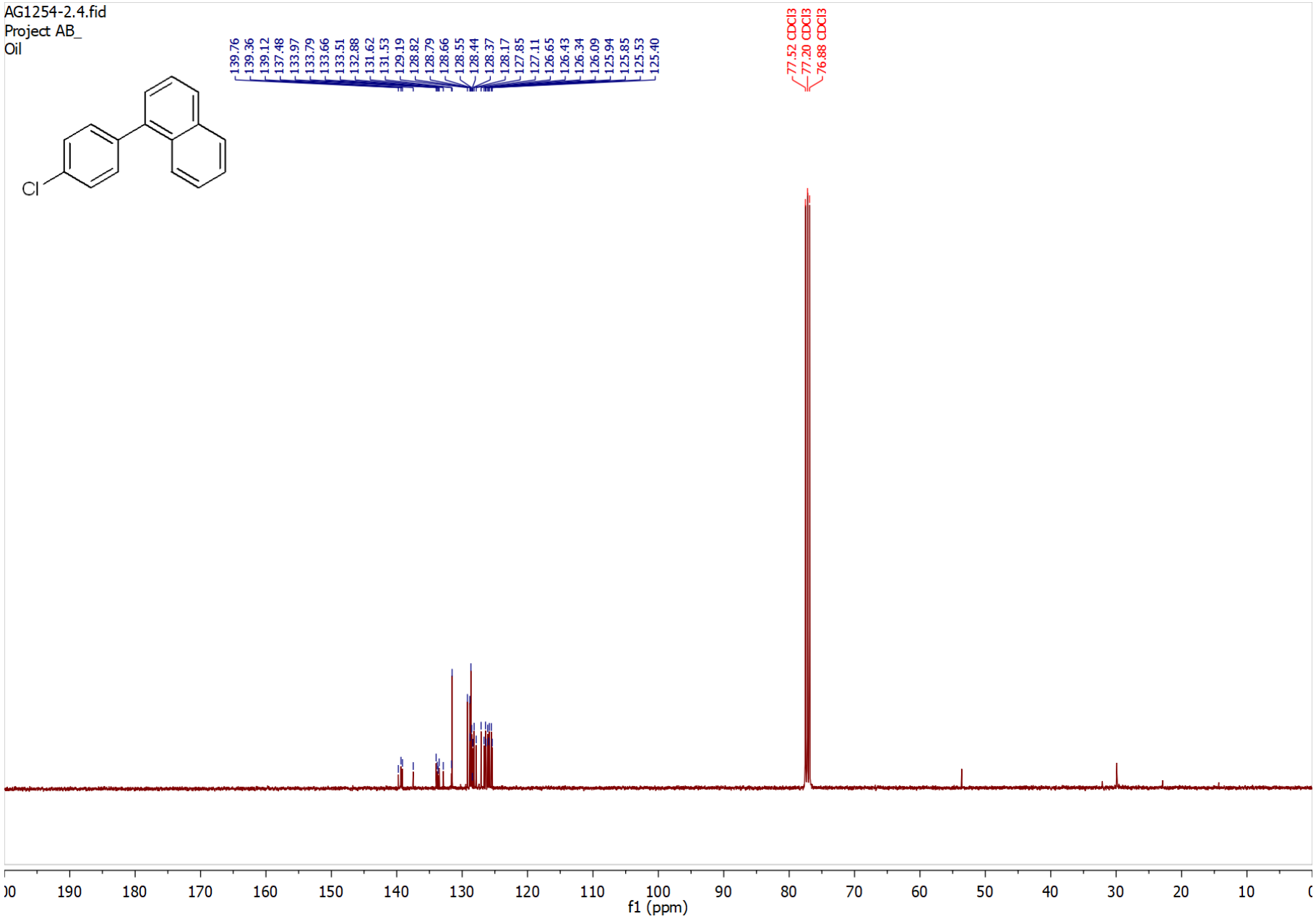
Compound 5n


AG1253.4.fid
Project AB_
Oil
Me
Me
Cl
140.12
140.04
138.55
133.28
129.38
129.22
128.92
128.54
125.06
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.54
f1 (ppm)

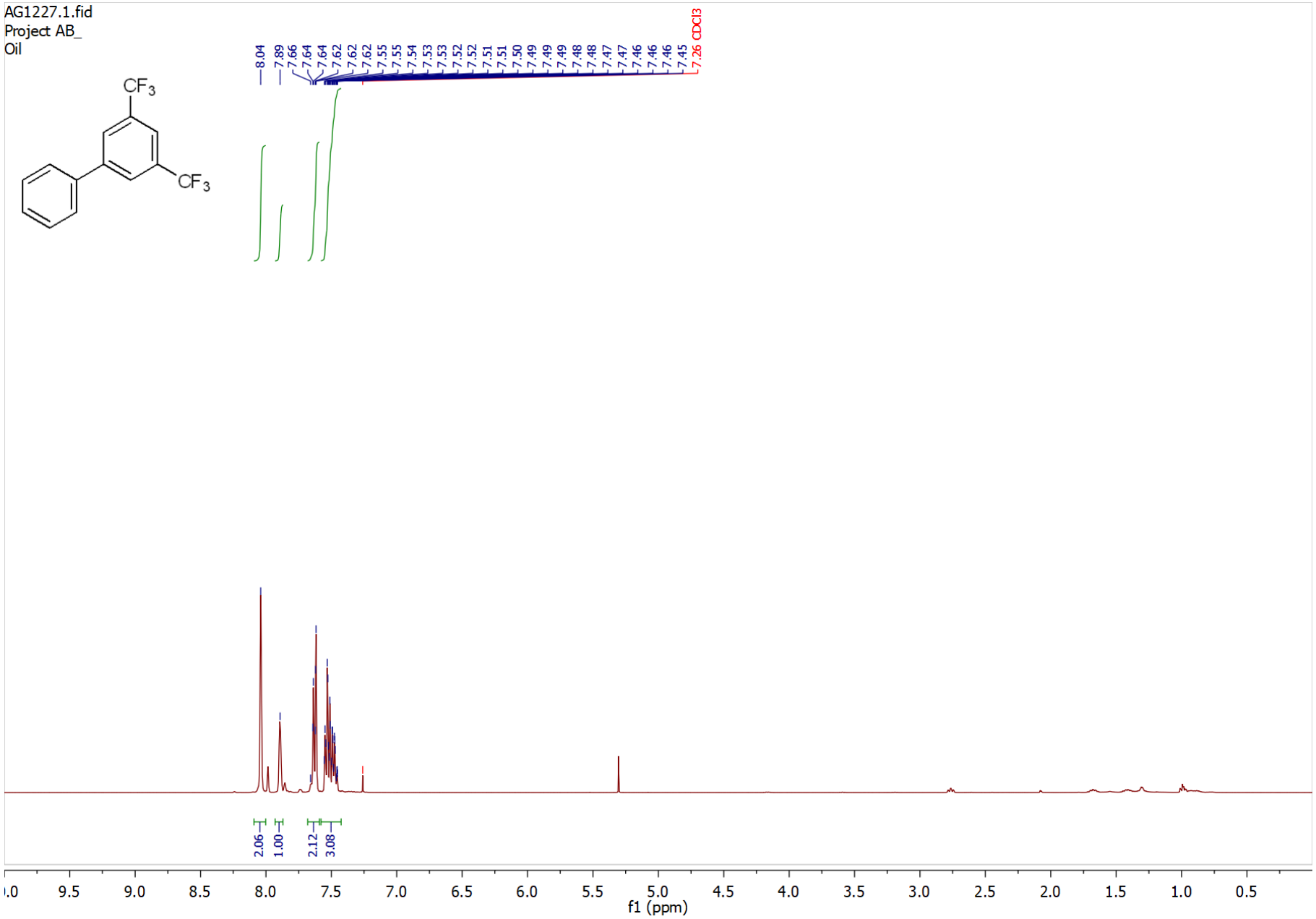
Compound 5o


AG1254-2.2.fid
Project AB_
Oil
7.93
7.93
7.91
7.90
7.89
7.87
7.86
7.83
7.66
7.65
7.64
7.54
7.53
7.51
7.49
7.49
7.48
7.47
7.46
7.45
7.44
7.44
7.43
7.42
7.42
7.41
7.39
7.26 CDCl3
Cl
3.52
1.00
7.50
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.
f1 (ppm)

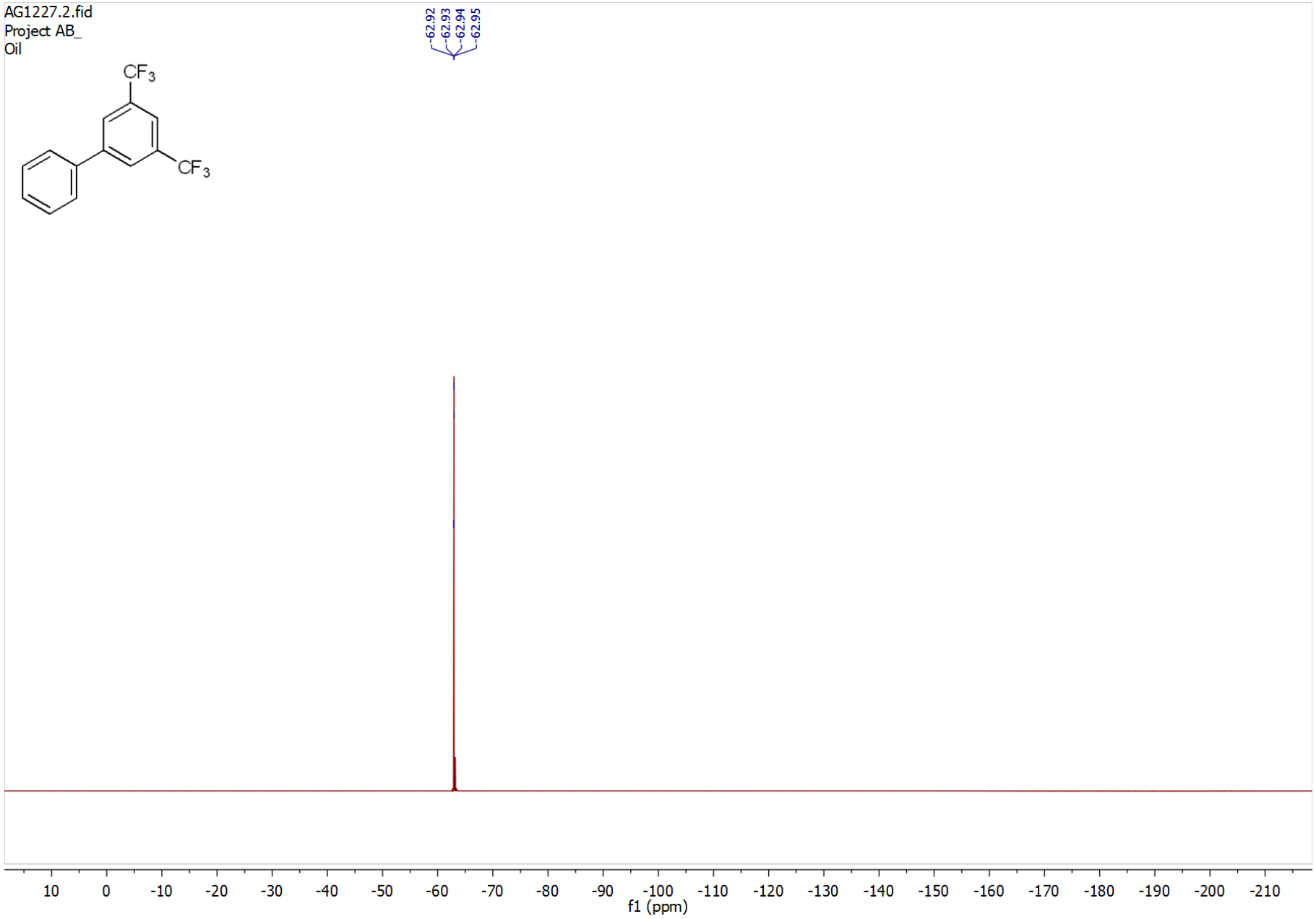
Compound 5o


AG1254-2.4.fid
Project AB_
Oil
139.76
139.36
139.12
137.48
133.97
133.79
133.66
133.51
132.88
131.62
131.53
129.19
128.82
128.79
128.66
128.55
128.44
128.37
128.17
127.85
127.11
126.65
126.43
126.34
126.09
125.94
125.85
125.53
125.40
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
Cl
f1 (ppm)

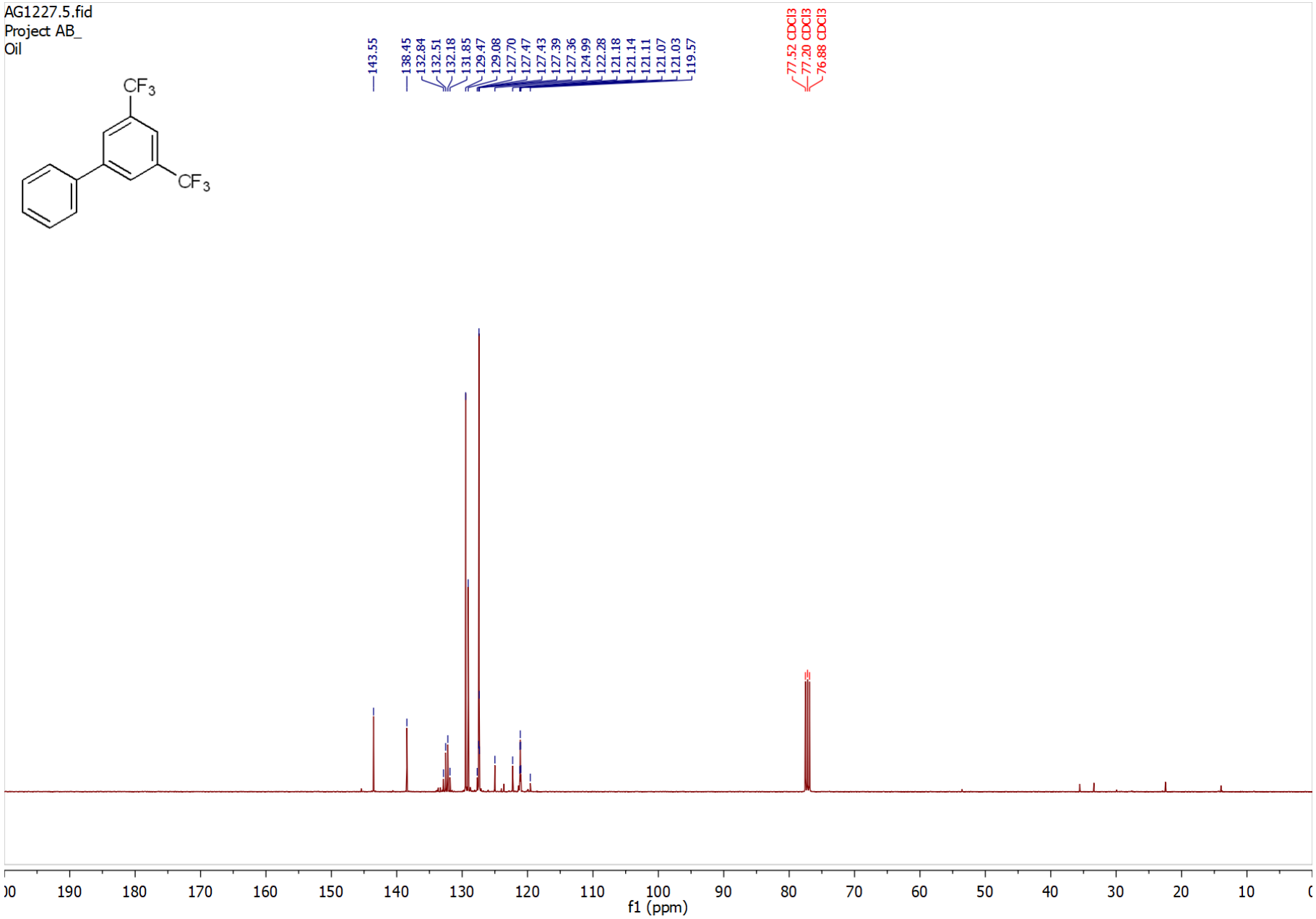
Compound 7a


AG1227.1.fid
Project AB_
Oil
CF3
CF3
8.04
7.89
7.66
7.64
7.64
7.62
7.62
7.62
7.55
7.55
7.54
7.53
7.53
7.52
7.52
7.51
7.51
7.50
7.49
7.49
7.49
7.48
7.48
7.47
7.47
7.46
7.46
7.46
7.45
7.26 CDCl3
2.06
1.00
2.12
3.08
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

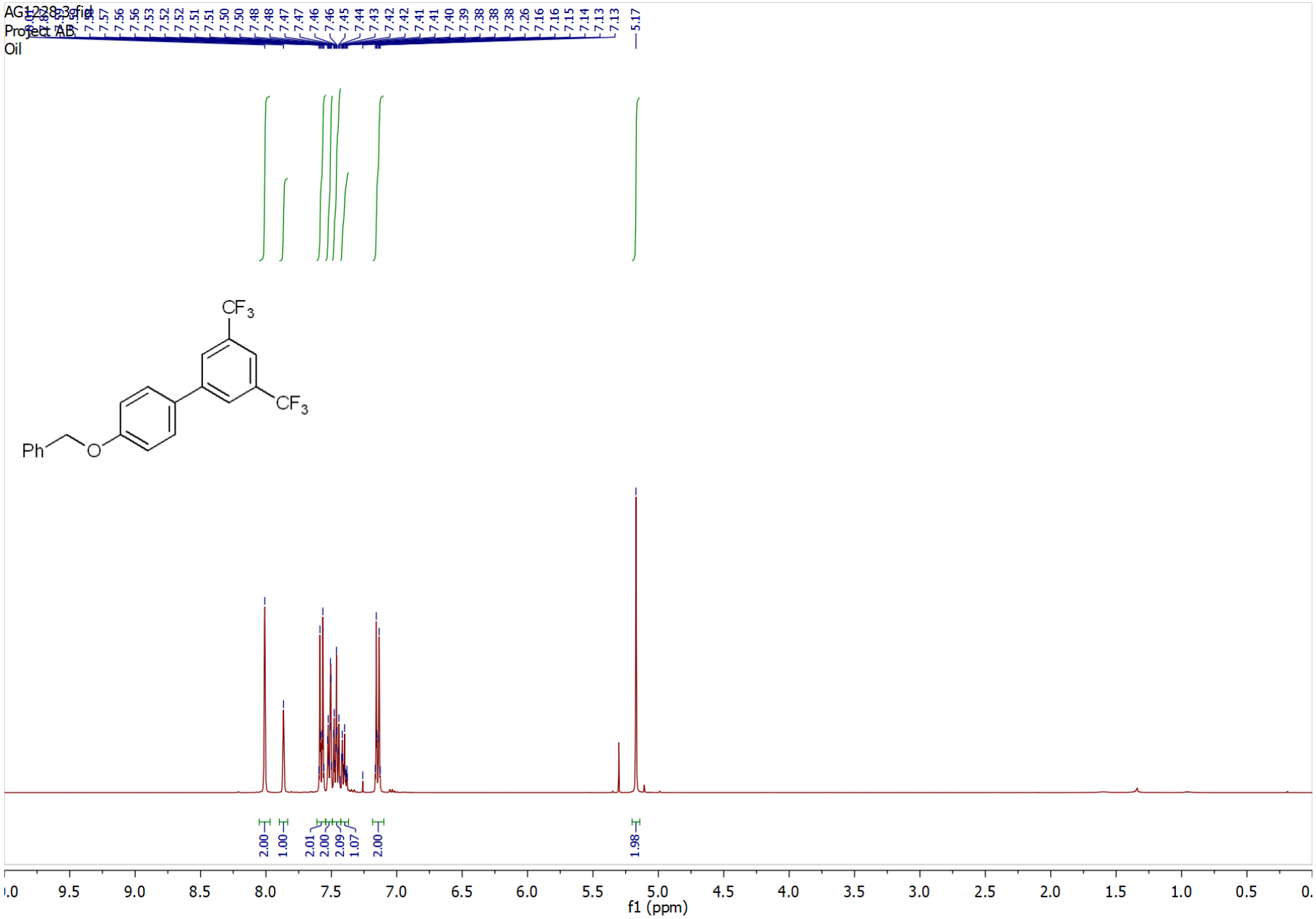
Compound 7a


AG1227.2.fid
Project AB_
Oil
-62.92
-62.93
-62.94
-62.95
CF3
CF3
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

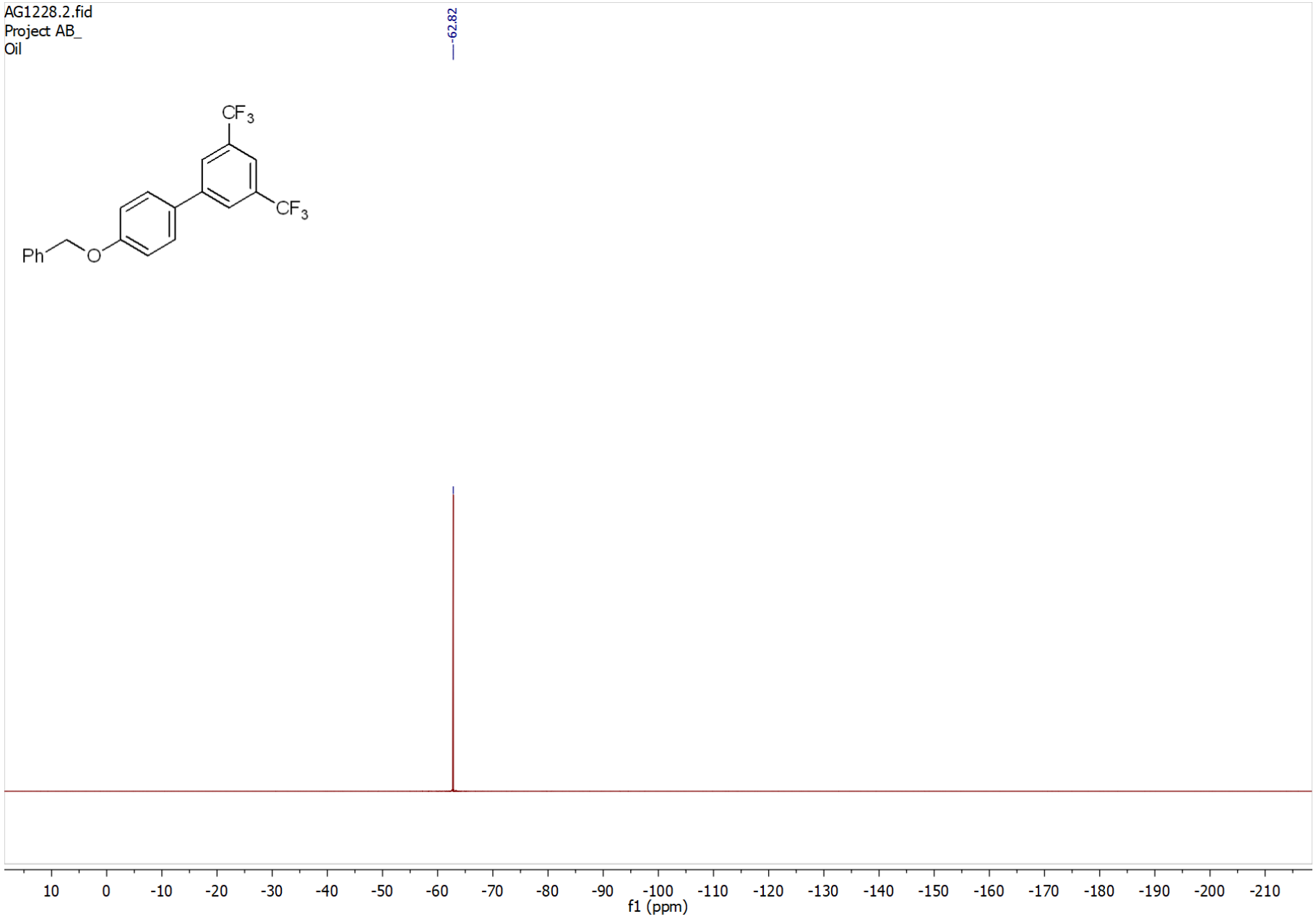
Compound 7a


AG1227.5.fid
Project AB_
Oil
CF3
CF3
143.55
138.45
132.84
132.51
132.18
131.85
129.47
129.08
127.70
127.47
127.43
127.39
127.36
124.99
122.28
121.18
121.14
121.11
121.07
121.03
119.57
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

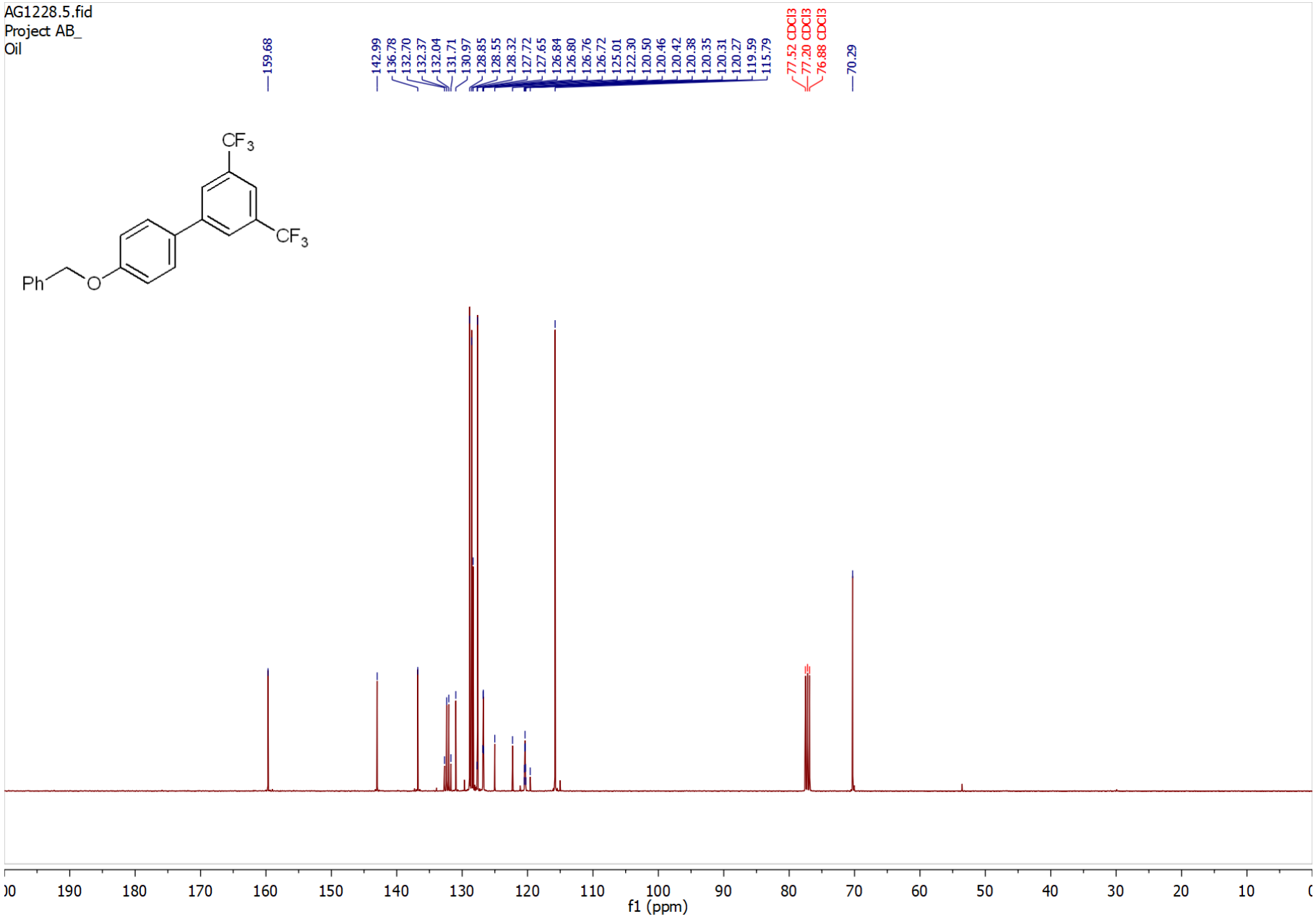
Compound 7b


AG1228-3.fid
Project AB
Oil
7.58
7.57
7.56
7.56
7.53
7.52
7.52
7.51
7.51
7.50
7.50
7.48
7.48
7.47
7.47
7.46
7.46
7.45
7.44
7.43
7.42
7.42
7.41
7.41
7.40
7.39
7.38
7.38
7.26
7.16
7.16
7.15
7.14
7.13
7.13
5.17
CF3
CF3
Ph
O
2.00
1.00
2.01
2.00
2.09
1.07
2.00
1.98
f1 (ppm)

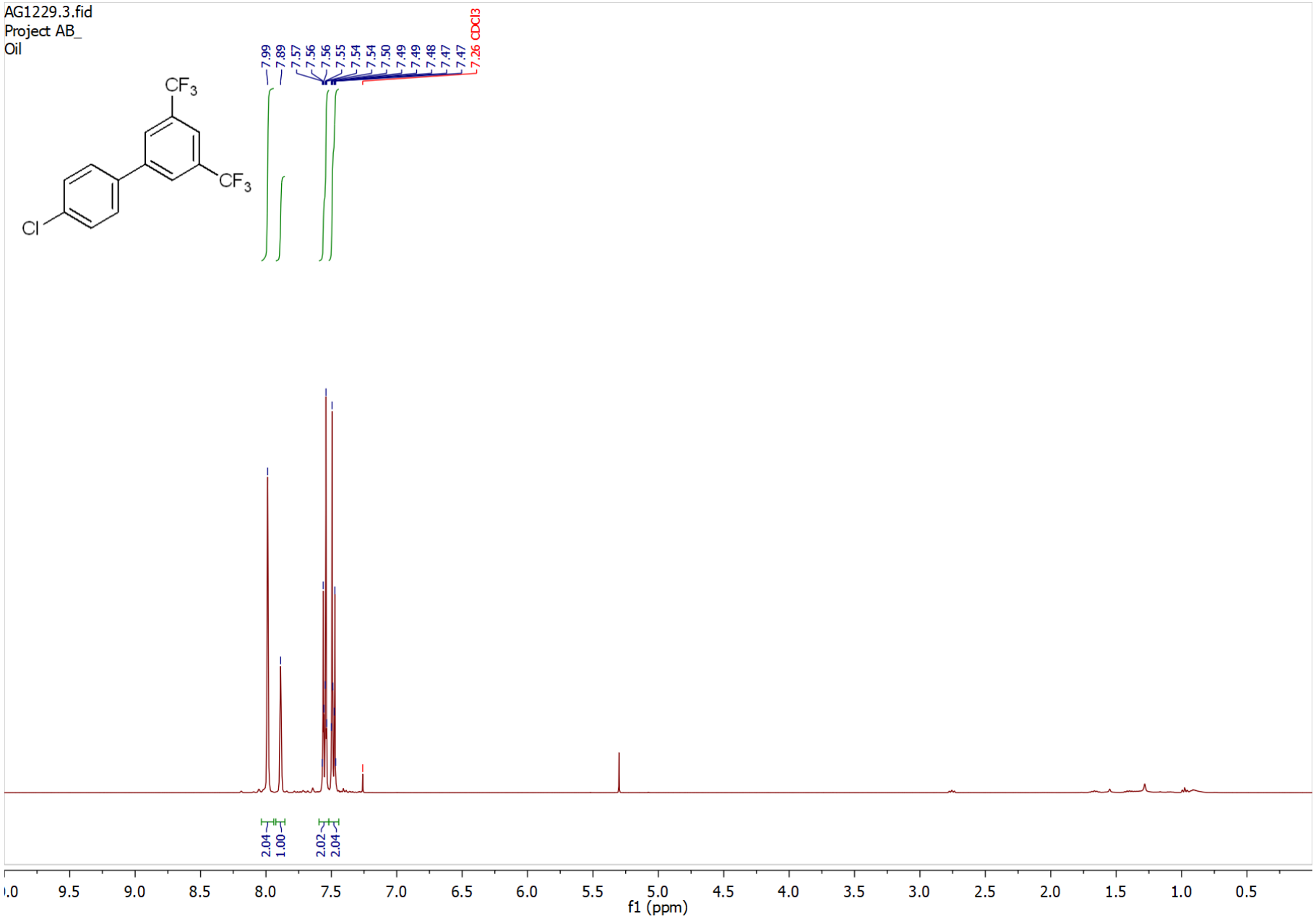
Compound 7b


AG1228.2.fid
Project AB_
Oil
-62.82
CF3
CF3
Ph
O
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

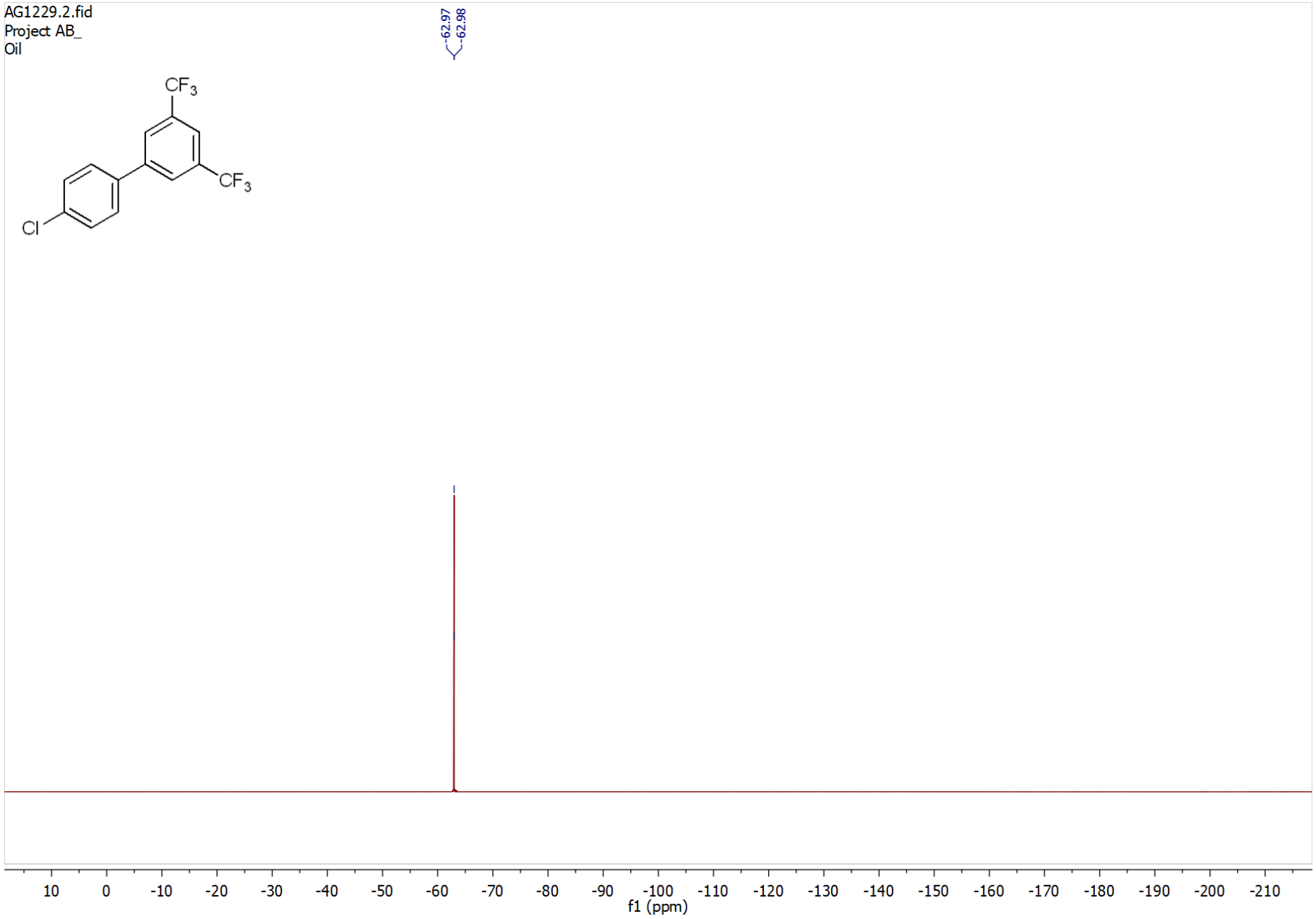
Compound 7b


AG1228.5.fid
Project AB_
Oil
159.68
142.99
136.78
132.70
132.37
132.04
131.71
130.97
128.85
128.55
128.32
127.72
127.65
126.84
126.80
126.76
126.72
125.01
122.30
120.50
120.46
120.42
120.38
120.35
120.31
120.27
119.59
115.79
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
70.29
CF3
CF3
Ph
O
f1 (ppm)

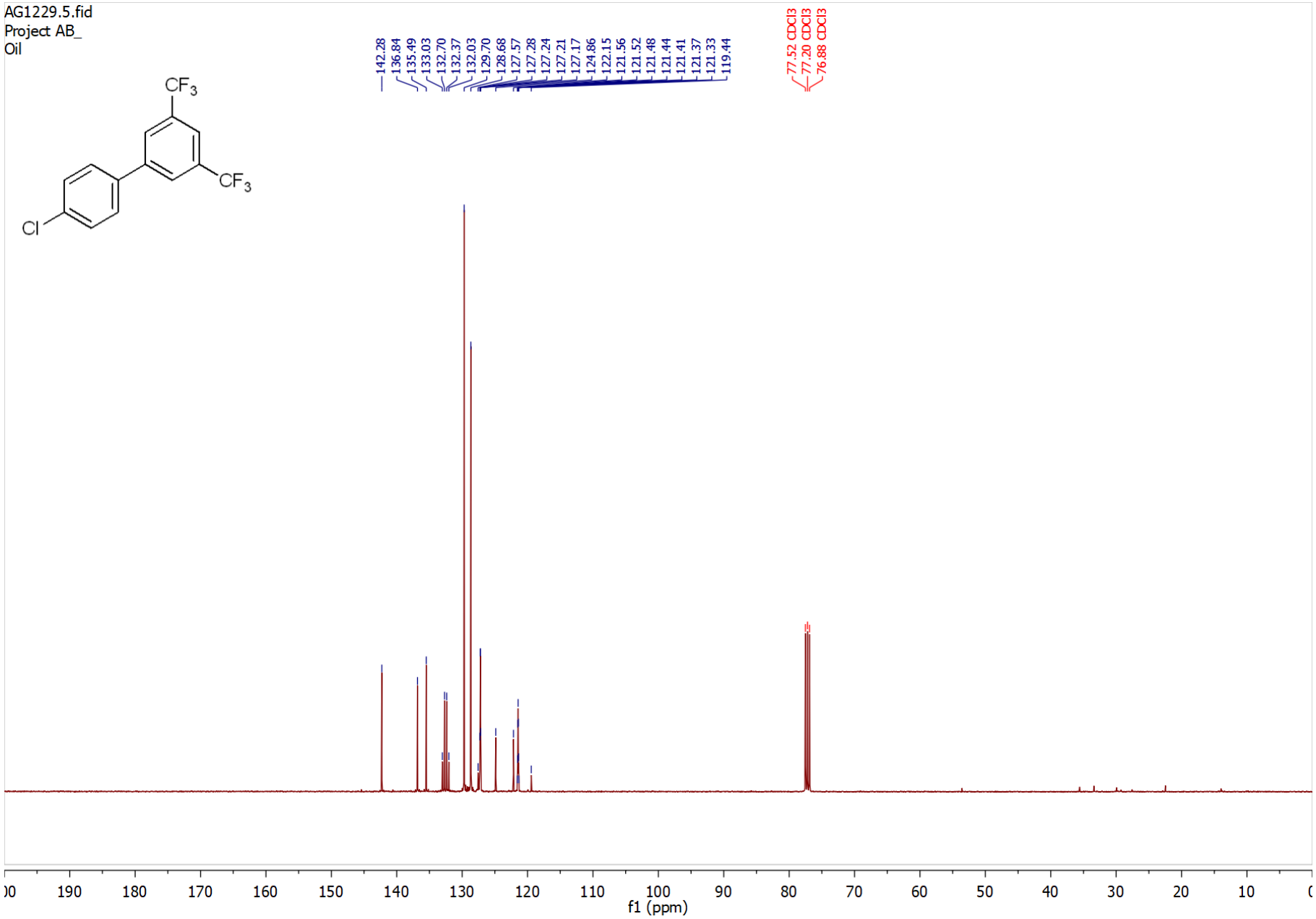
Compound 7c


AG1229.3.fid
Project AB_
Oil
CF3
CF3
Cl
7.99
7.89
7.57
7.56
7.56
7.55
7.54
7.54
7.50
7.49
7.49
7.48
7.47
7.47
7.26 CDCl3
2.04
1.00
2.02
2.04
f1 (ppm)

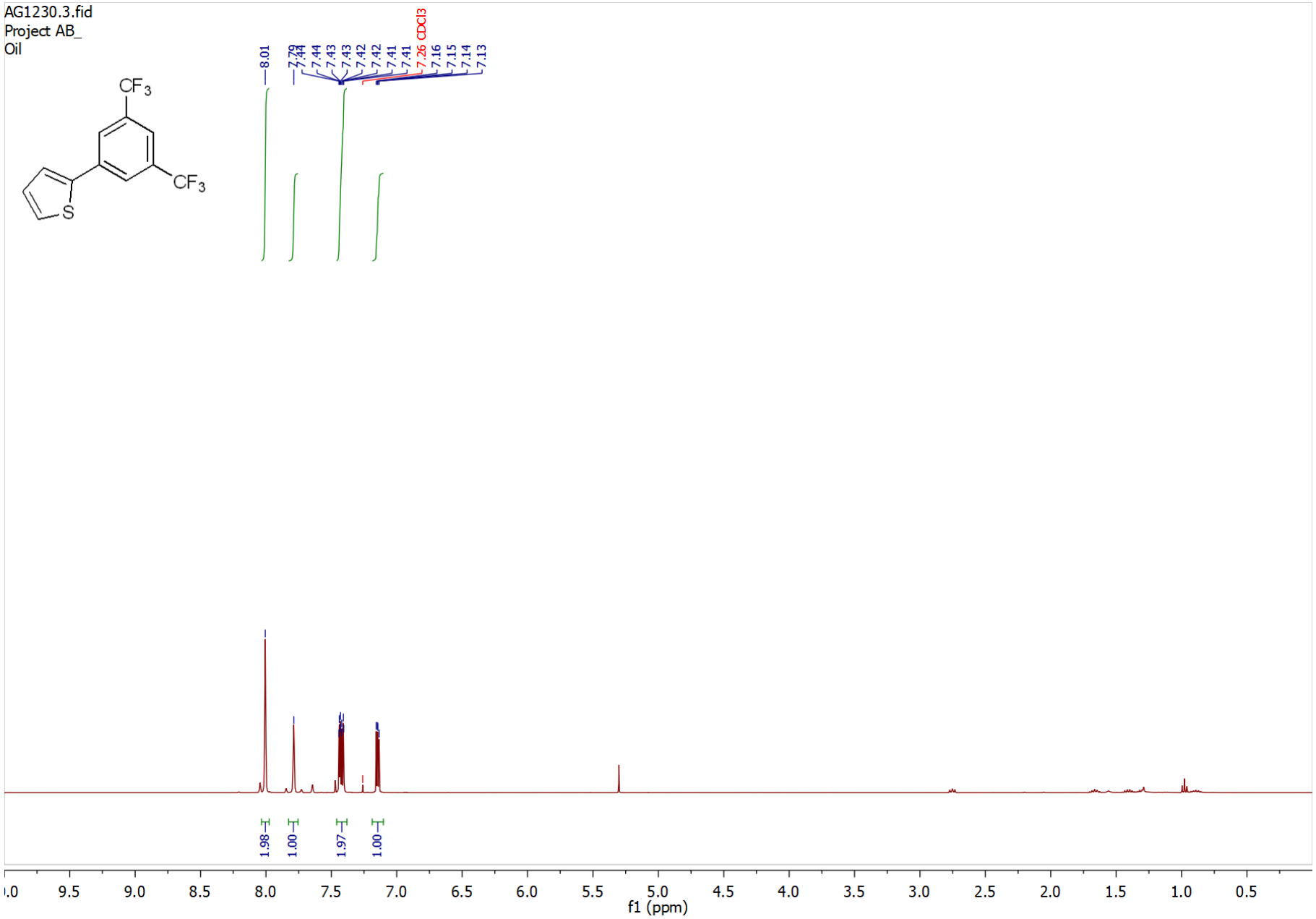
Compound 7c


AG1229.2.fid
Project AB_
Oil
-62.97
-62.98
CF3
CF3
Cl
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

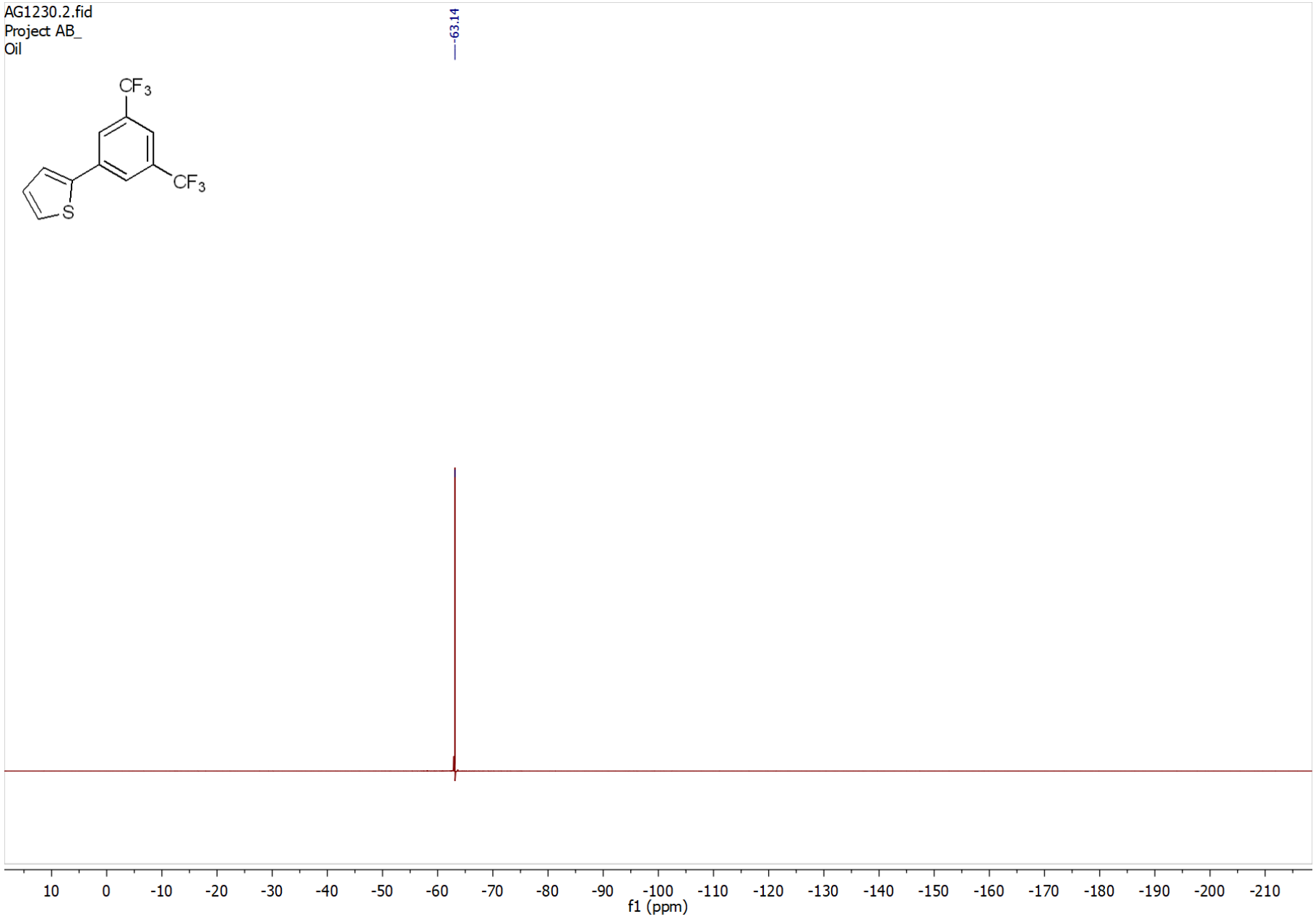
Compound 7c


AG1229.5.fid
Project AB_
Oil
142.28
136.84
135.49
133.03
132.70
132.37
132.03
129.70
128.68
127.57
127.28
127.24
127.21
127.17
124.86
122.15
121.56
121.52
121.48
121.44
121.41
121.37
121.33
119.44
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
Cl
f1 (ppm)

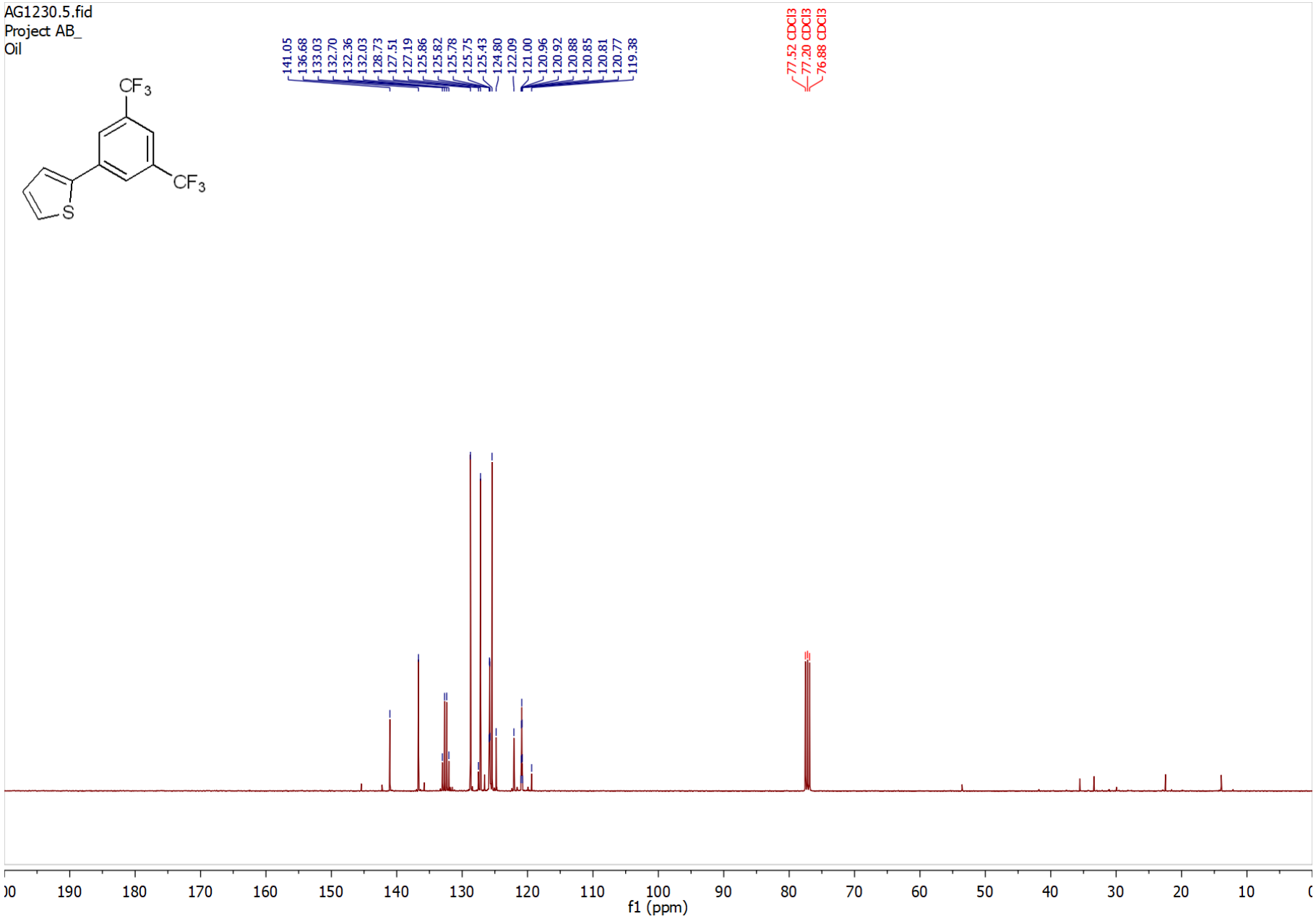
Compound 7d


AG1230.3.fid
Project AB_
Oil
CF3
CF3
S
8.01
7.79
7.44
7.44
7.43
7.43
7.42
7.42
7.41
7.41
7.26 CDCl3
7.16
7.15
7.14
7.13
1.98
1.00
1.97
1.00
f1 (ppm)

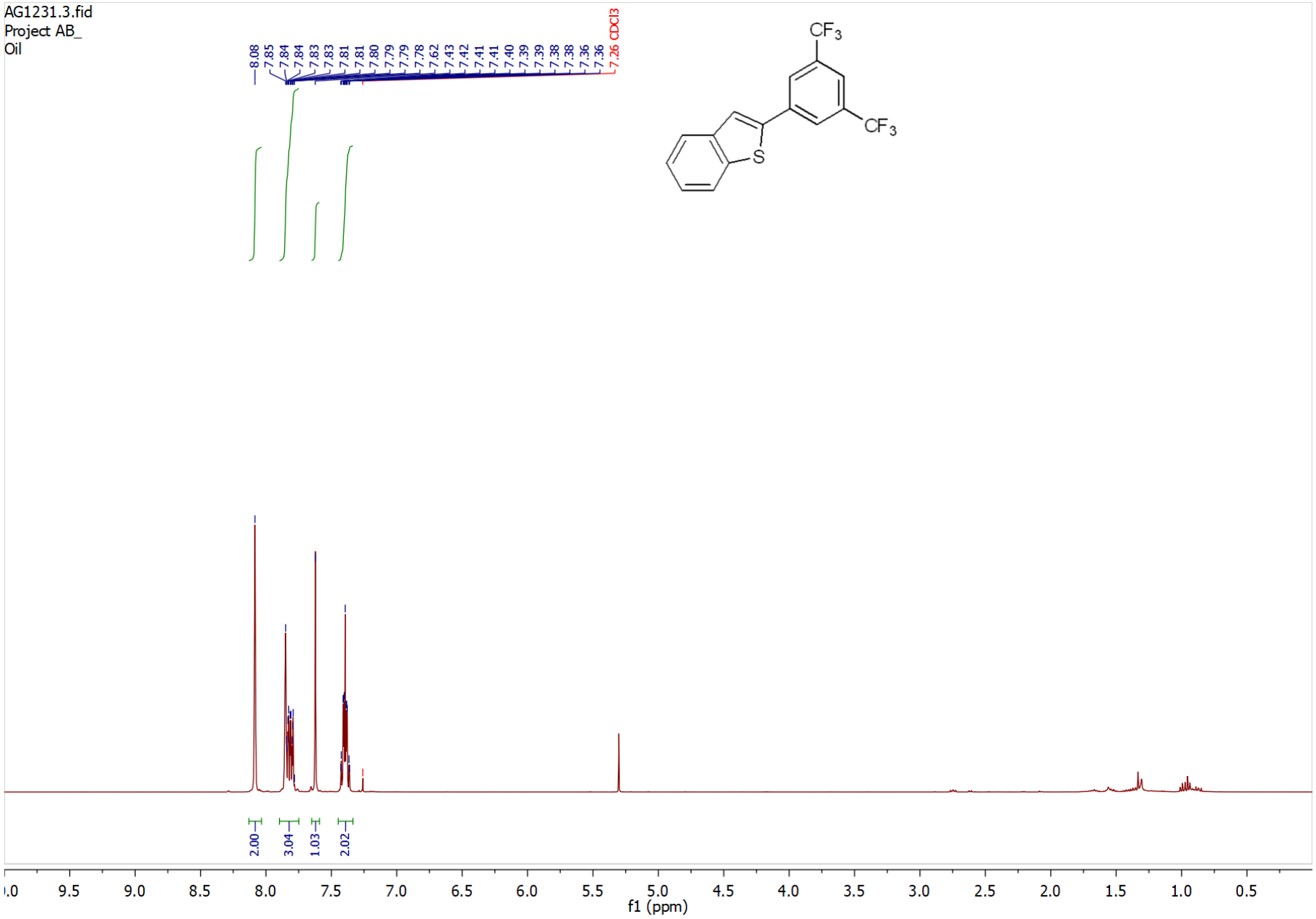
Compound 7d


AG1230.2.fid
Project AB_
Oil
63.14
CF3
CF3
S
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

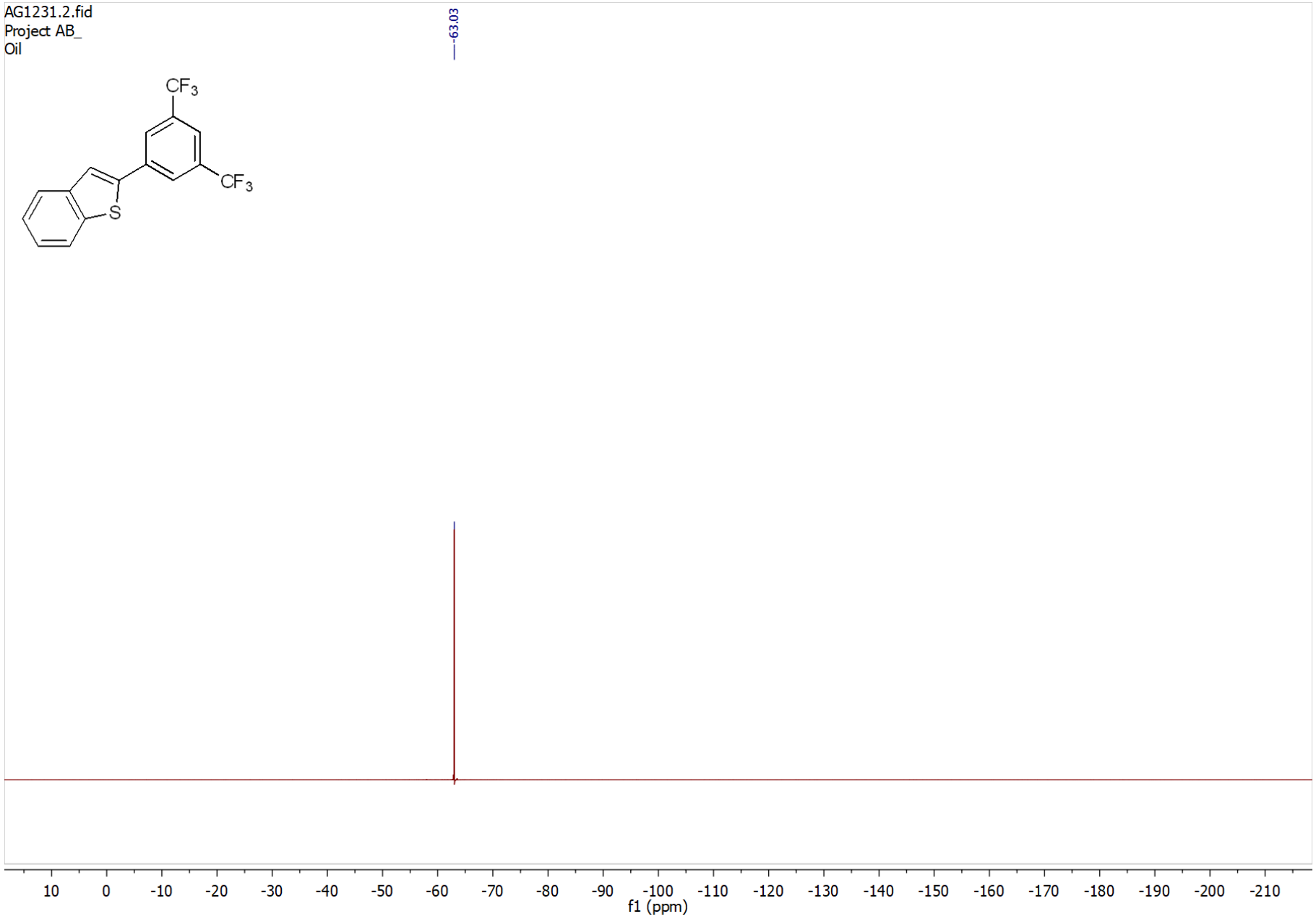
Compound 7d


AG1230.5.fid
Project AB_
Oil
141.05
136.68
133.03
132.70
132.36
132.03
128.73
127.51
127.19
125.86
125.82
125.78
125.75
125.43
124.80
122.09
121.00
120.96
120.92
120.88
120.85
120.81
120.77
119.38
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
S
f1 (ppm)

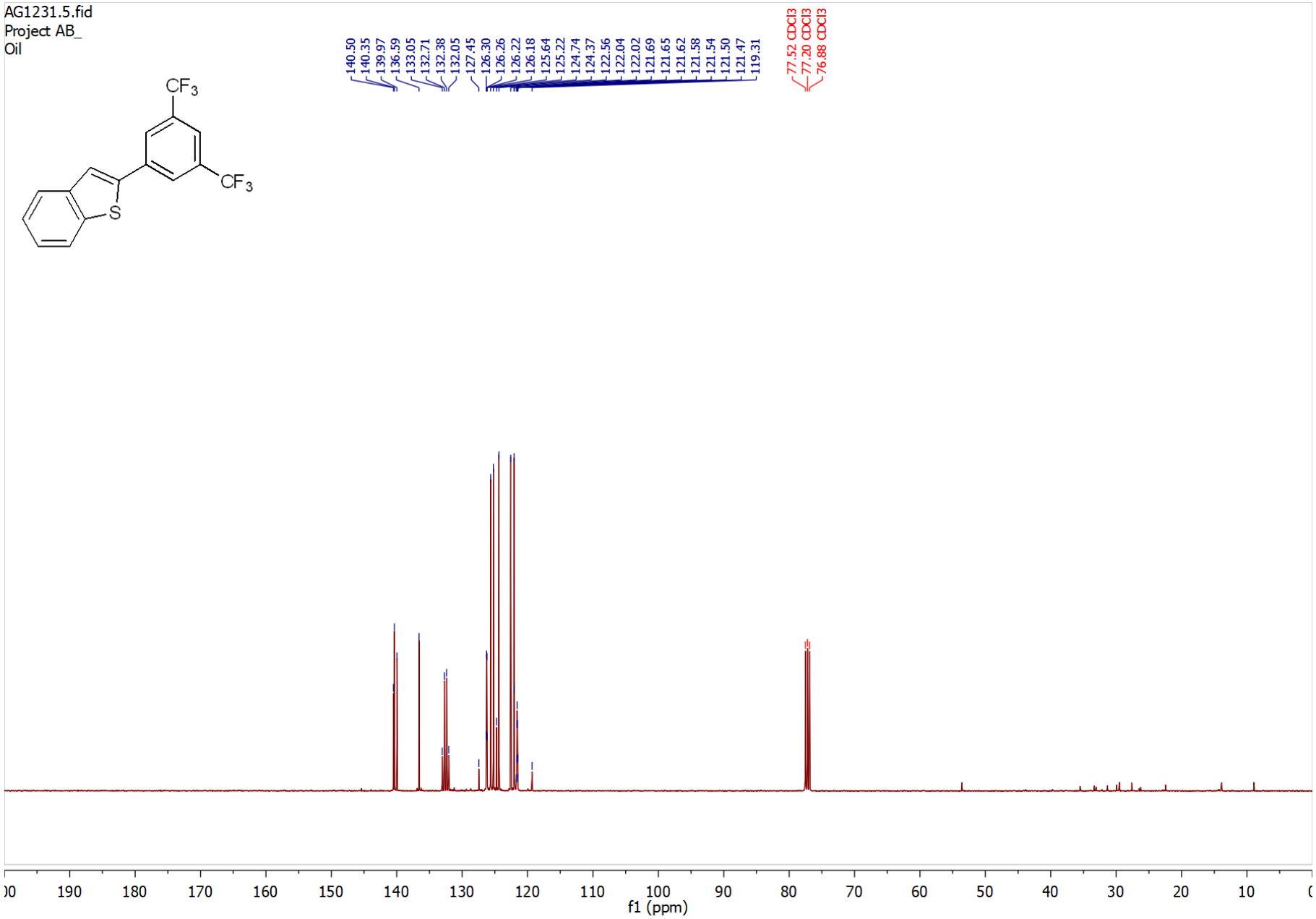
Compound 7e


AG1231.3.fid
Project AB_
Oil
8.08
7.85
7.84
7.84
7.83
7.83
7.81
7.81
7.80
7.79
7.79
7.78
7.62
7.43
7.42
7.41
7.41
7.40
7.39
7.39
7.38
7.38
7.36
7.36
7.26 CDCl3
CF3
CF3
S
2.00
3.04
1.03
2.02
f1 (ppm)

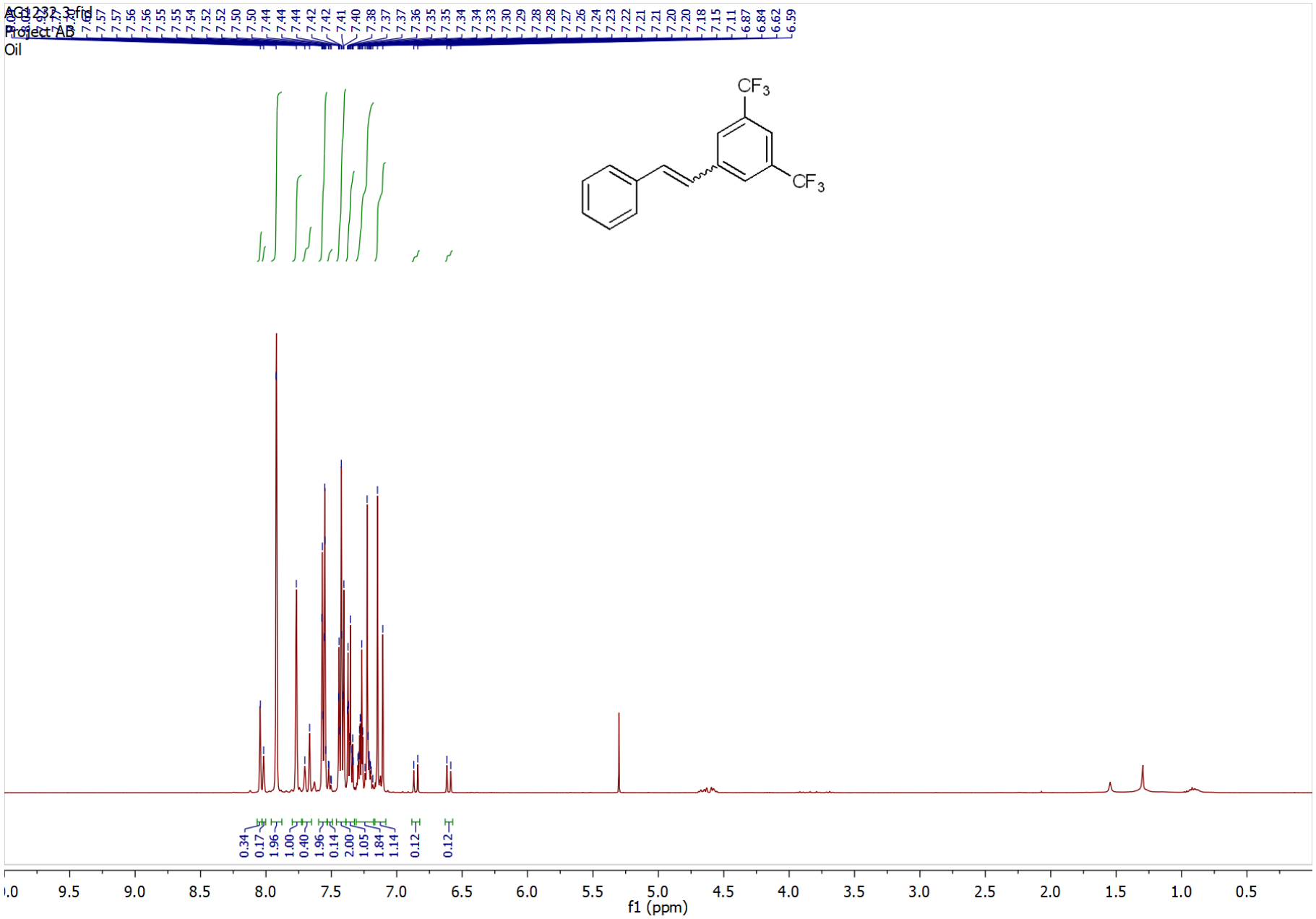
Compound 7e


AG1231.2.fid
Project AB_
Oil
-63.03
CF3
CF3
S
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

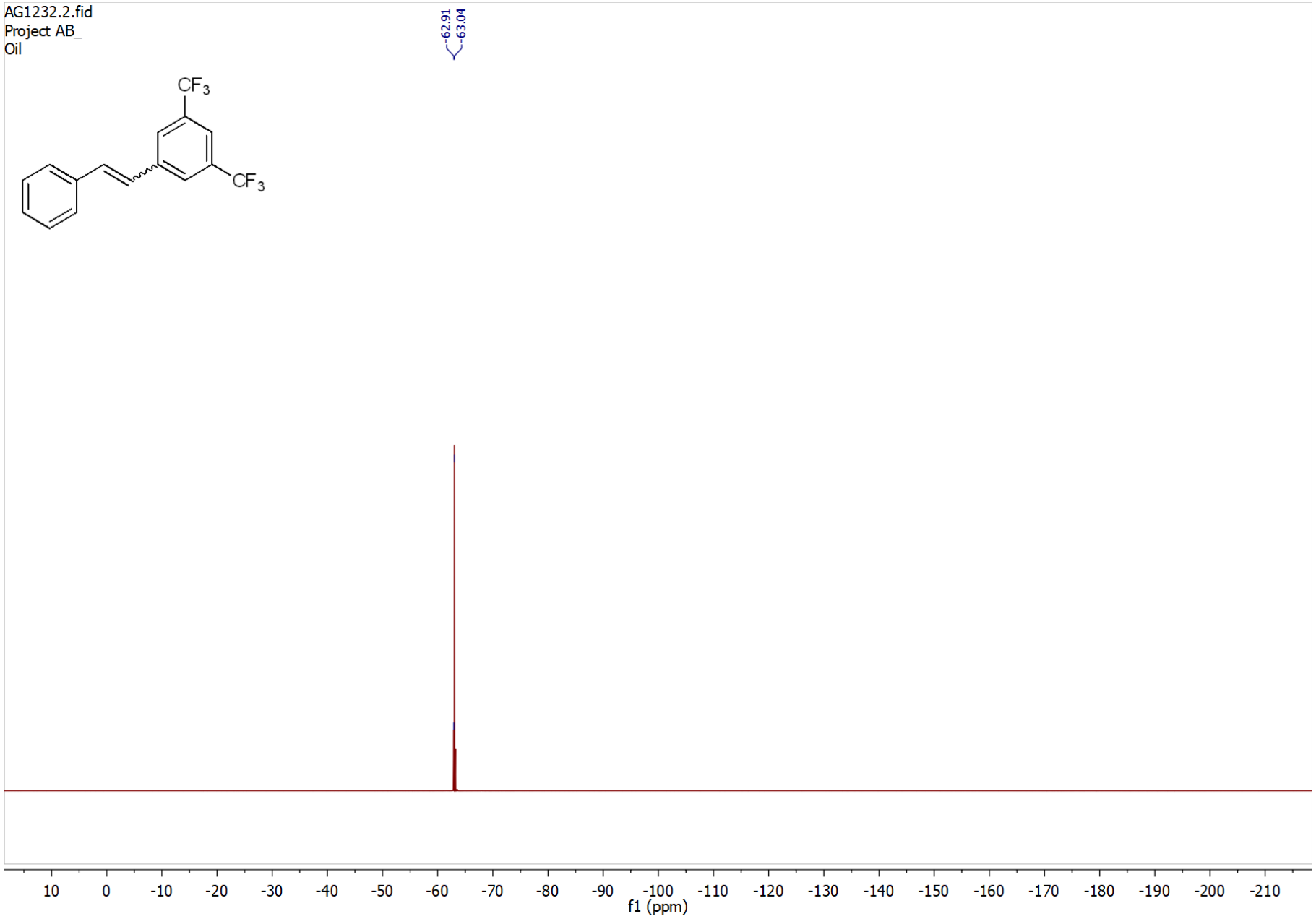
Compound 7e


AG1231.5.fid
Project AB_
Oil
140.50
140.35
139.97
136.59
133.05
132.71
132.38
132.05
127.45
126.30
126.26
126.22
126.18
125.64
125.22
124.74
124.37
122.56
122.04
122.02
121.69
121.65
121.62
121.58
121.54
121.50
121.47
119.31
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
S
f1 (ppm)

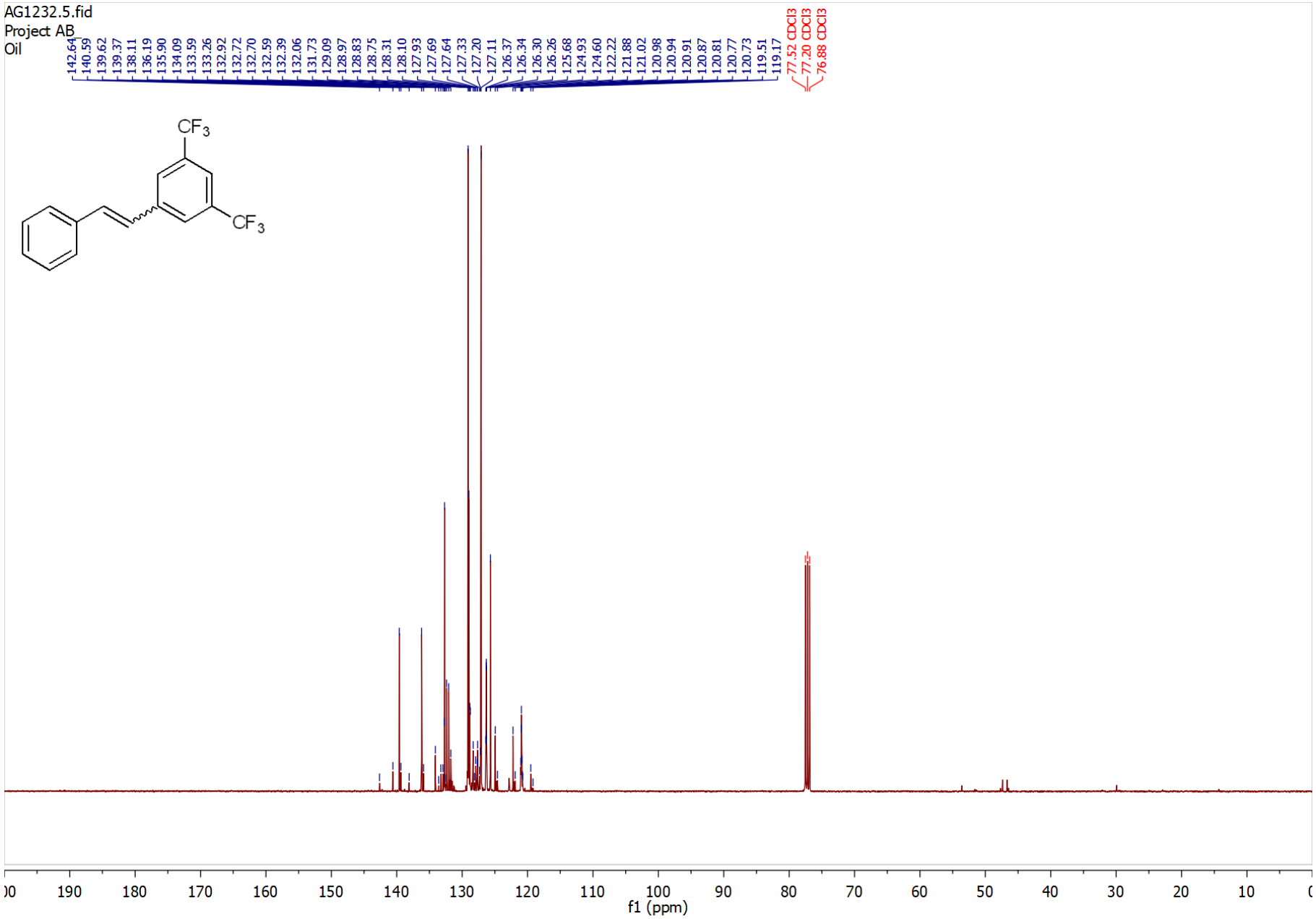
Compound 7f


AG1232_3.fid
Project AB
Oil
CF3
CF3
0.34
0.17
1.96
1.00
0.40
1.96
0.14
2.00
1.05
1.84
1.14
0.12
0.12
f1 (ppm)

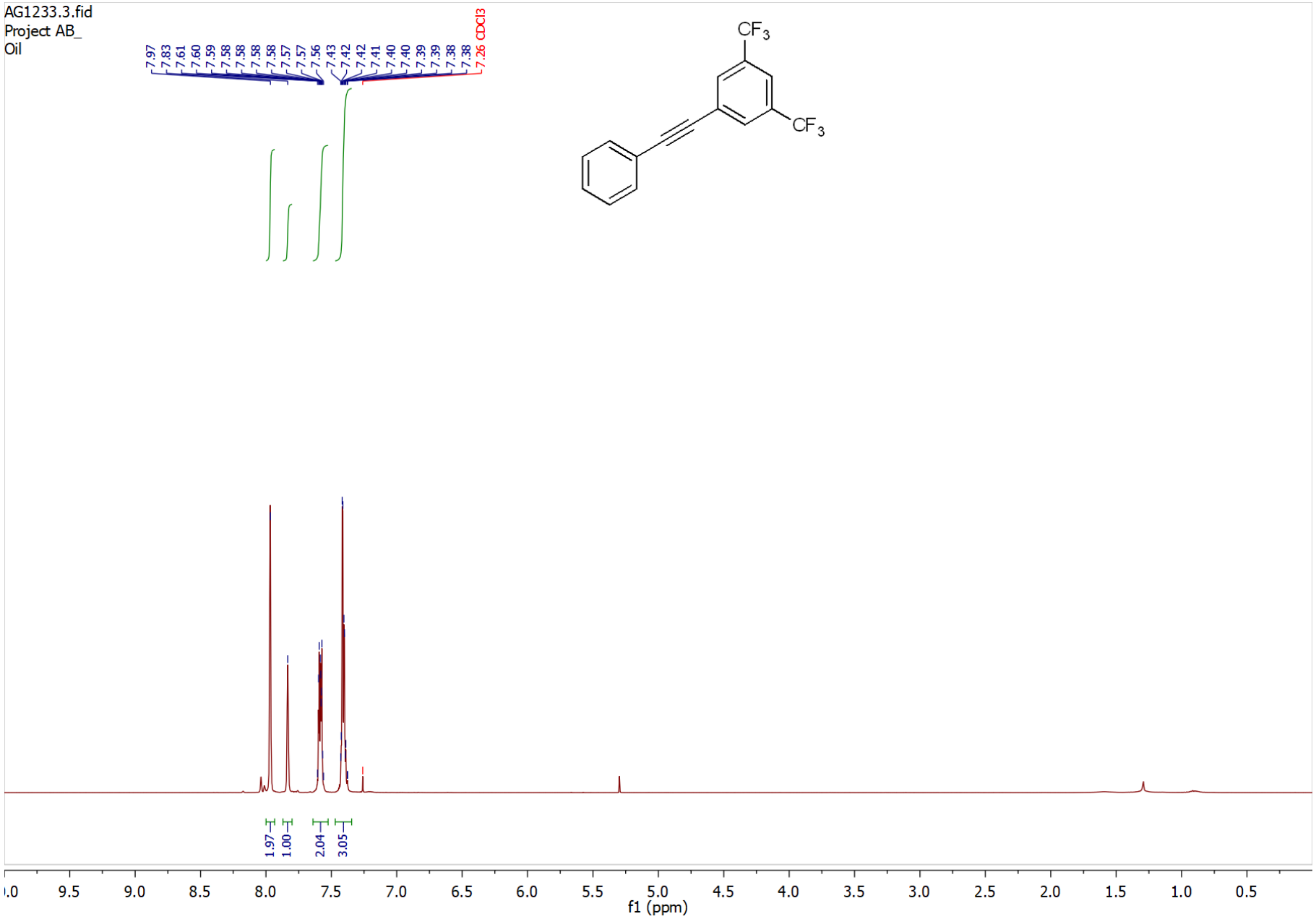
Compound 7f


AG1232.2.fid
Project AB_
Oil
-62.91
-63.04
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

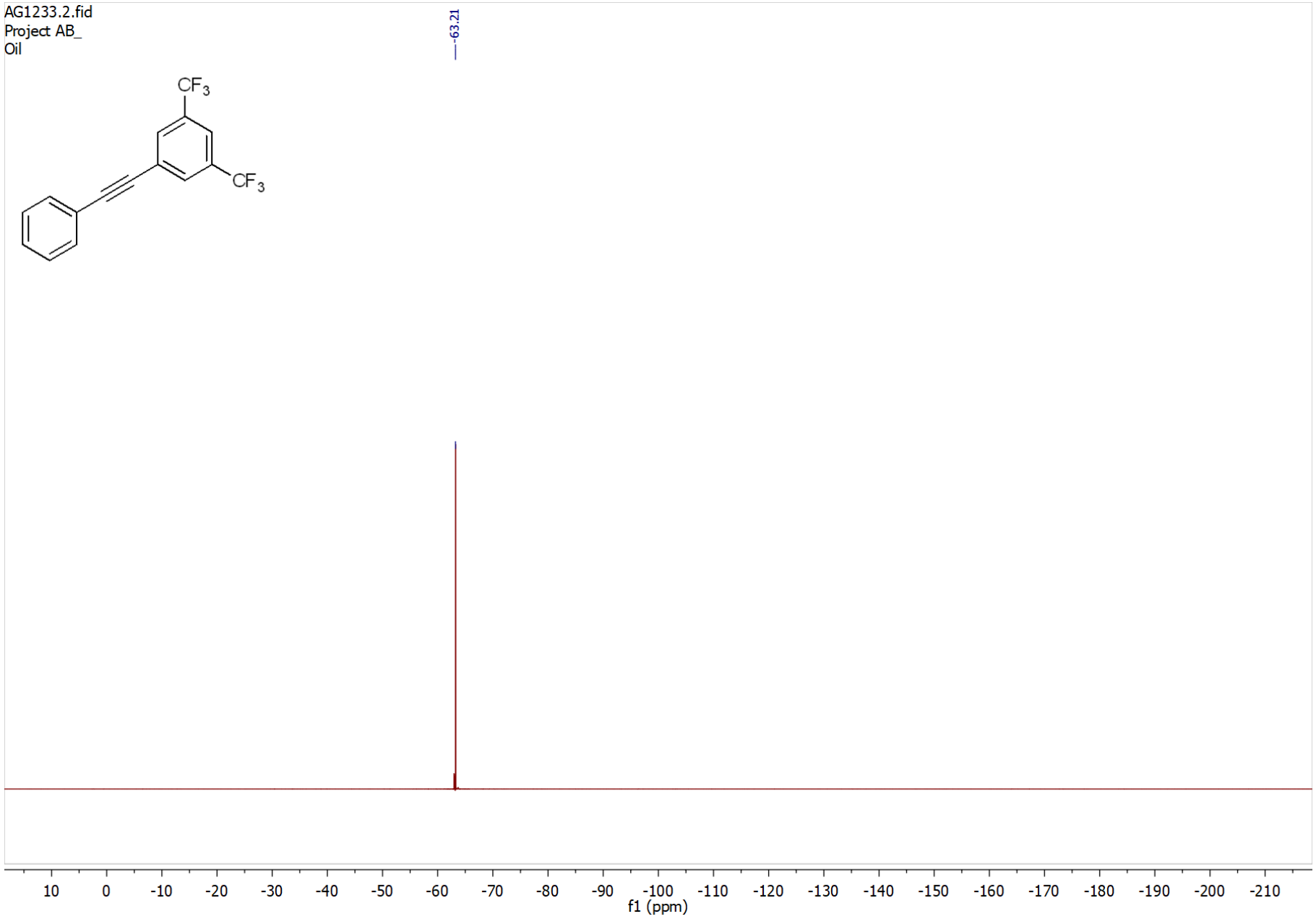
Compound 7f


AG1232.5.fid
Project AB
Oil
142.64
140.59
139.62
139.37
138.11
136.19
135.90
134.09
133.59
133.26
132.92
132.72
132.70
132.59
132.39
132.06
131.73
129.09
128.97
128.83
128.75
128.31
128.10
127.93
127.69
127.64
127.33
127.20
127.11
126.37
126.34
126.30
126.26
125.68
124.93
124.60
122.22
121.88
121.02
120.98
120.94
120.91
120.87
120.81
120.77
120.73
119.51
119.17
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

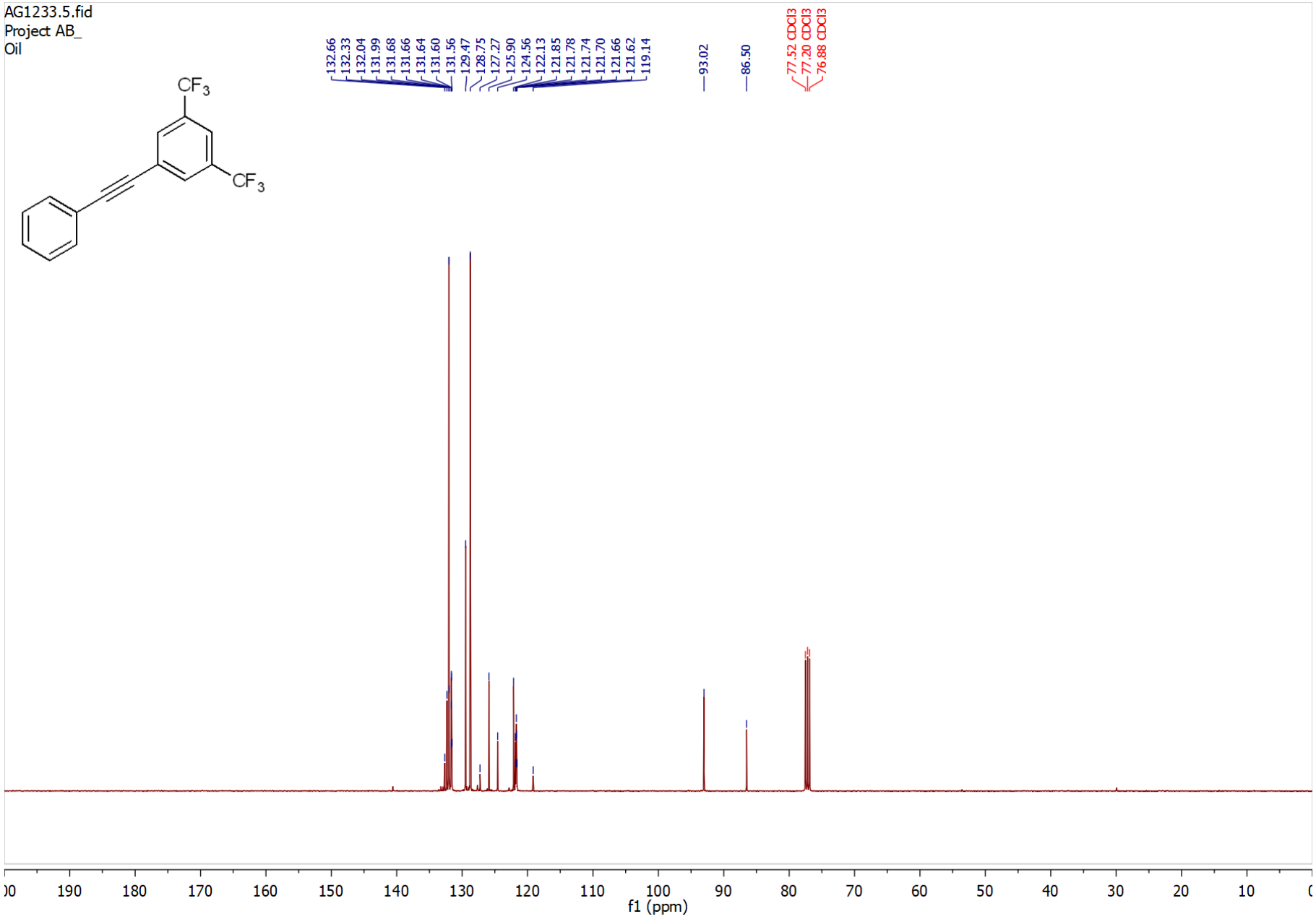
Compound 7g


AG1233.3.fid
Project AB_
Oil
7.97
7.83
7.61
7.60
7.59
7.58
7.58
7.58
7.58
7.57
7.57
7.56
7.43
7.42
7.42
7.41
7.40
7.40
7.39
7.39
7.38
7.38
7.26 CDCl3
CF3
CF3
1.97
1.00
2.04
3.05
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

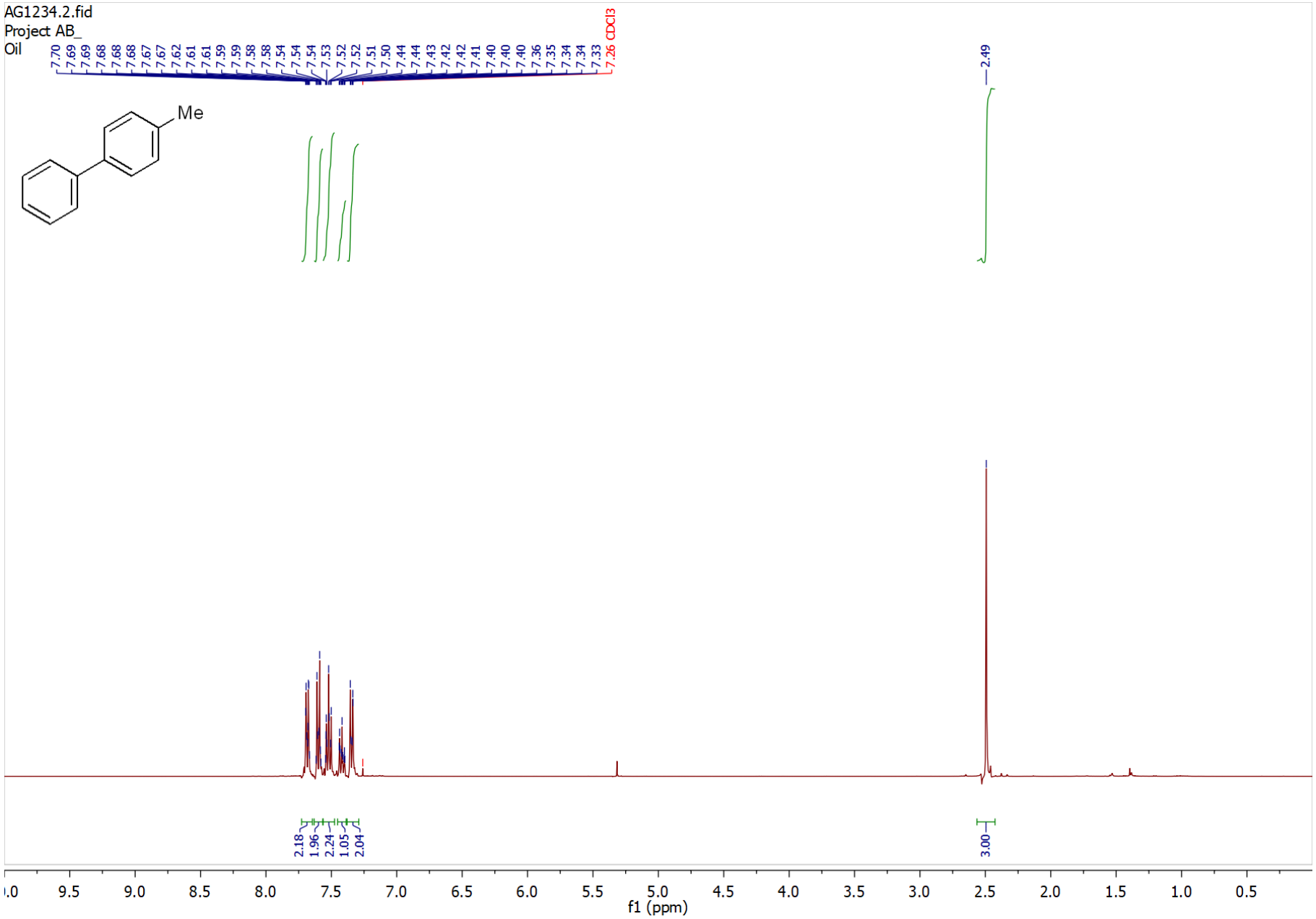
Compound 7g


AG1233.2.fid
Project AB_
Oil
63.21
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

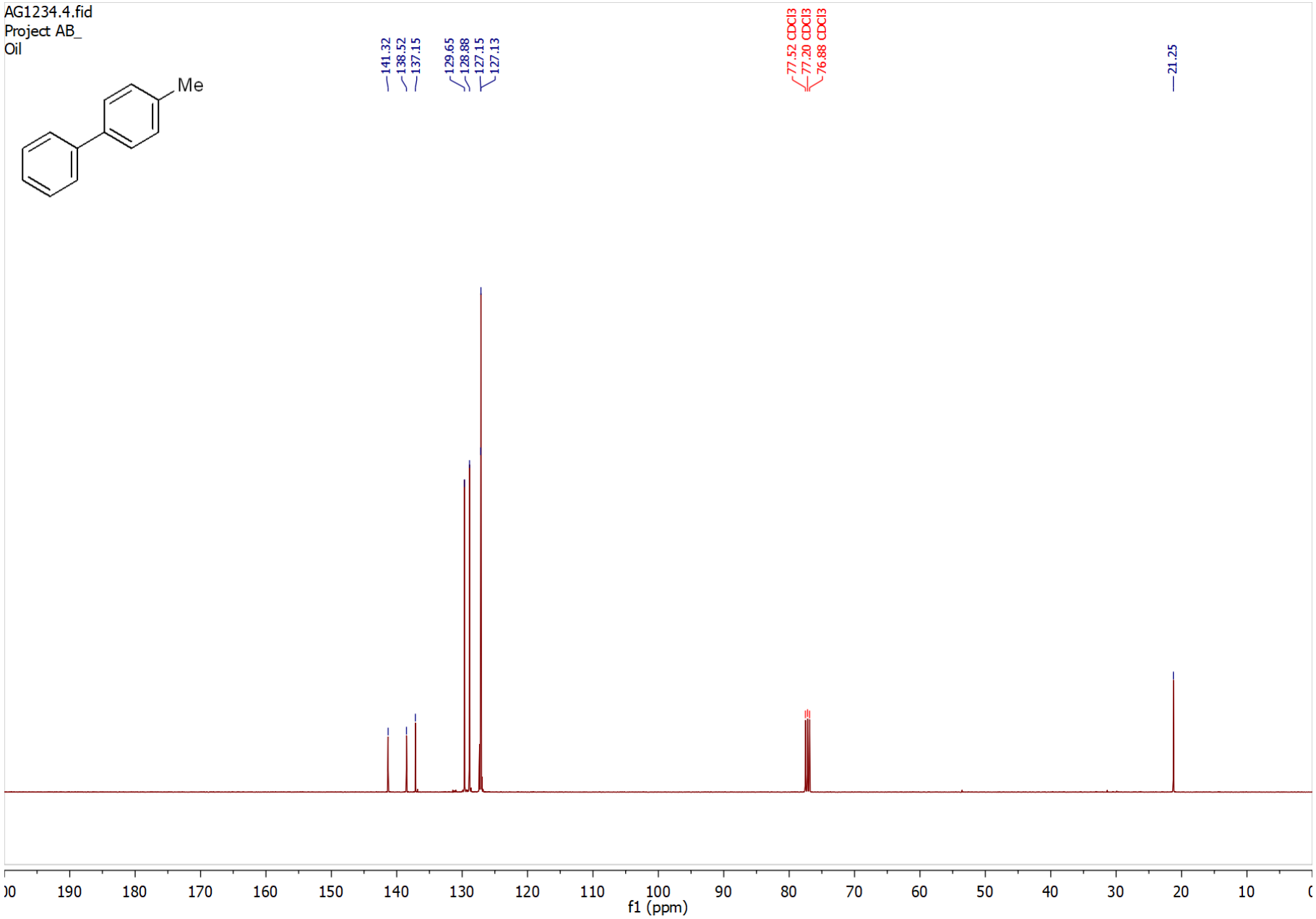
Compound 7g


AG1233.5.fid
Project AB_
Oil
CF3
CF3
132.66
132.33
132.04
131.99
131.68
131.66
131.64
131.60
131.56
129.47
128.75
127.27
125.90
124.56
122.13
121.85
121.78
121.74
121.70
121.66
121.62
119.14
93.02
86.50
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

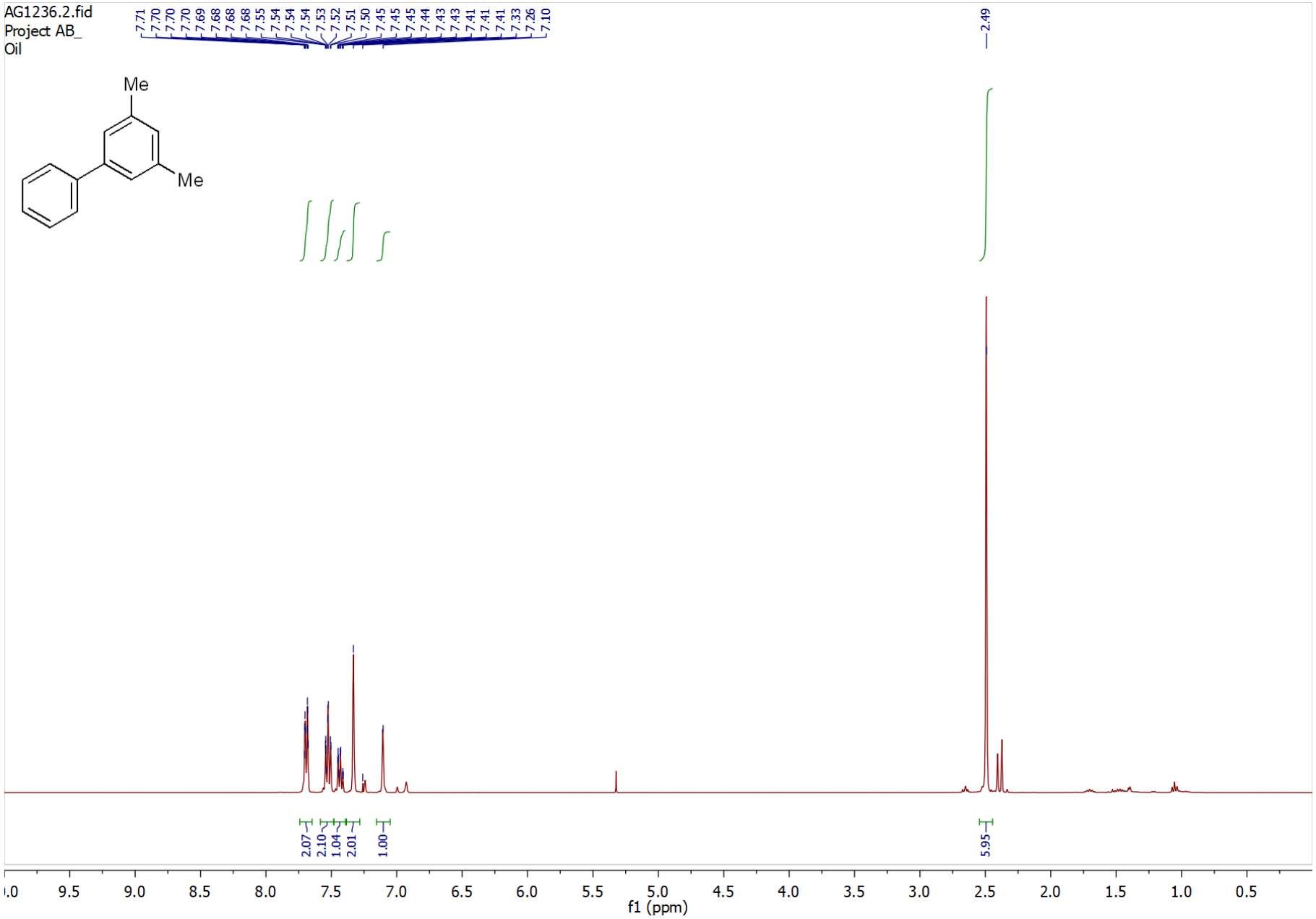
Compound 7i


AG1234.2.fid
Project AB_
Oil
7.70 7.69 7.69 7.68 7.68 7.68 7.67 7.67 7.62 7.61 7.61 7.59 7.59 7.58 7.58 7.54 7.54 7.54 7.53 7.52 7.52 7.51 7.50 7.44 7.44 7.43 7.42 7.42 7.41 7.40 7.40 7.40 7.36 7.35 7.34 7.34 7.33 7.26 CDCl3
2.49
Me
2.18
1.96
2.24
1.05
2.04
3.00
f1 (ppm)

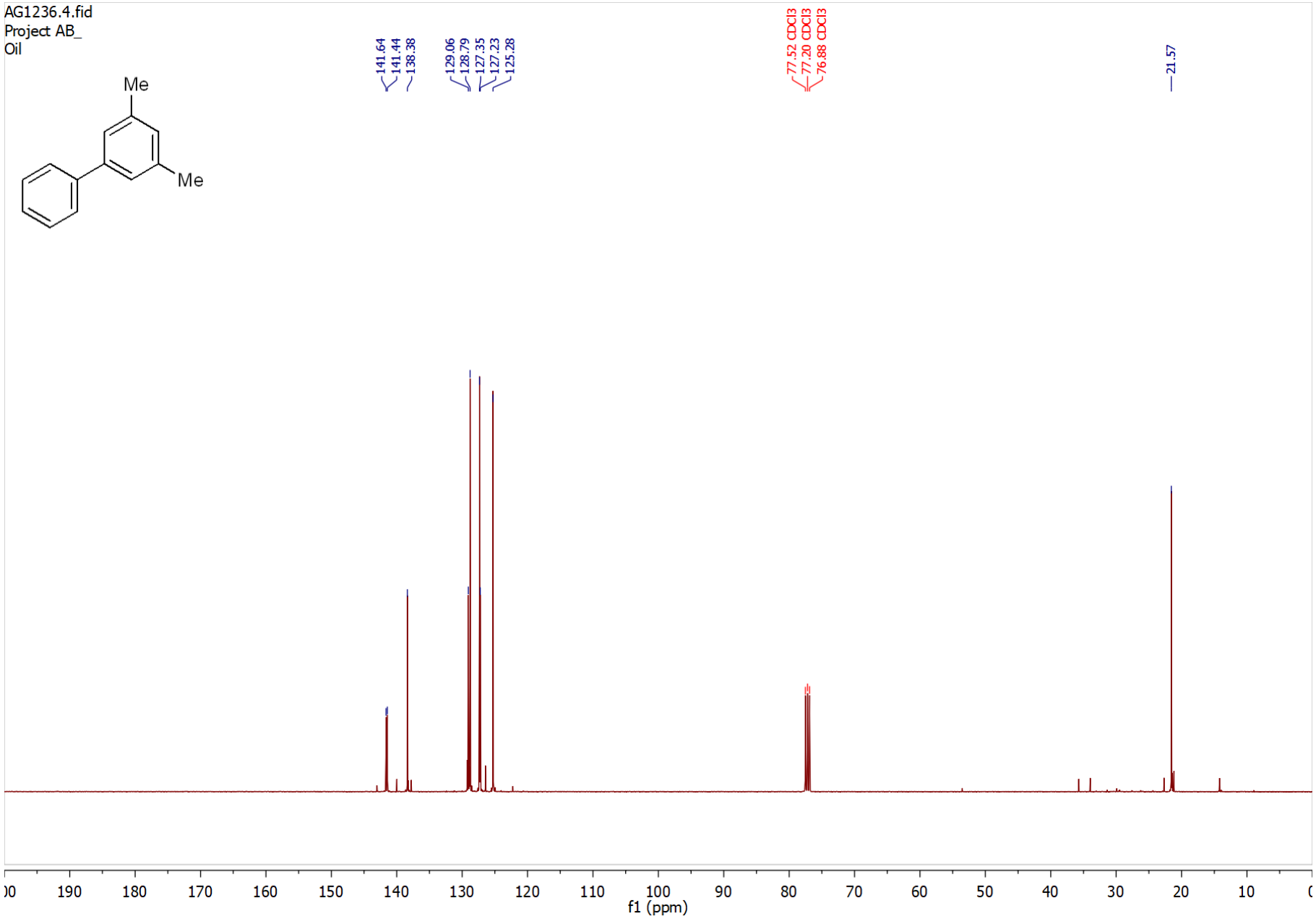
Compound 7i


AG1234.4.fid
Project AB_
Oil
Me
141.32
138.52
137.15
129.65
128.88
127.15
127.13
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.25
f1 (ppm)

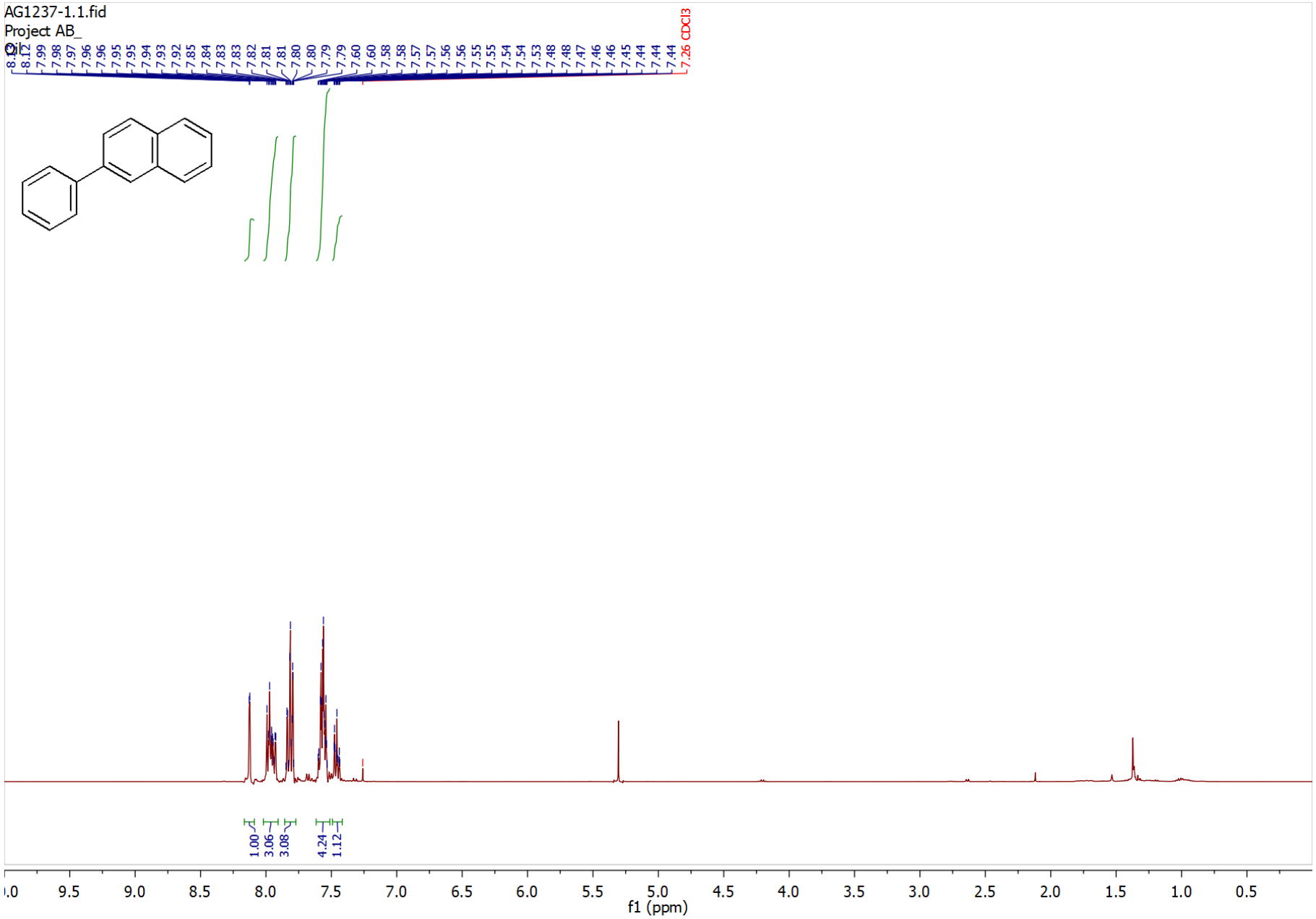
Compound 7j


AG1236.2.fid
Project AB_
Oil
7.71 7.70 7.70 7.70 7.69 7.68 7.68 7.68 7.55 7.54 7.54 7.54 7.53 7.52 7.51 7.50 7.45 7.45 7.45 7.44 7.43 7.43 7.41 7.41 7.41 7.33 7.26 7.10
2.49
Me
Me
2.07
2.10
1.04
2.01
1.00
5.95
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
f1 (ppm)

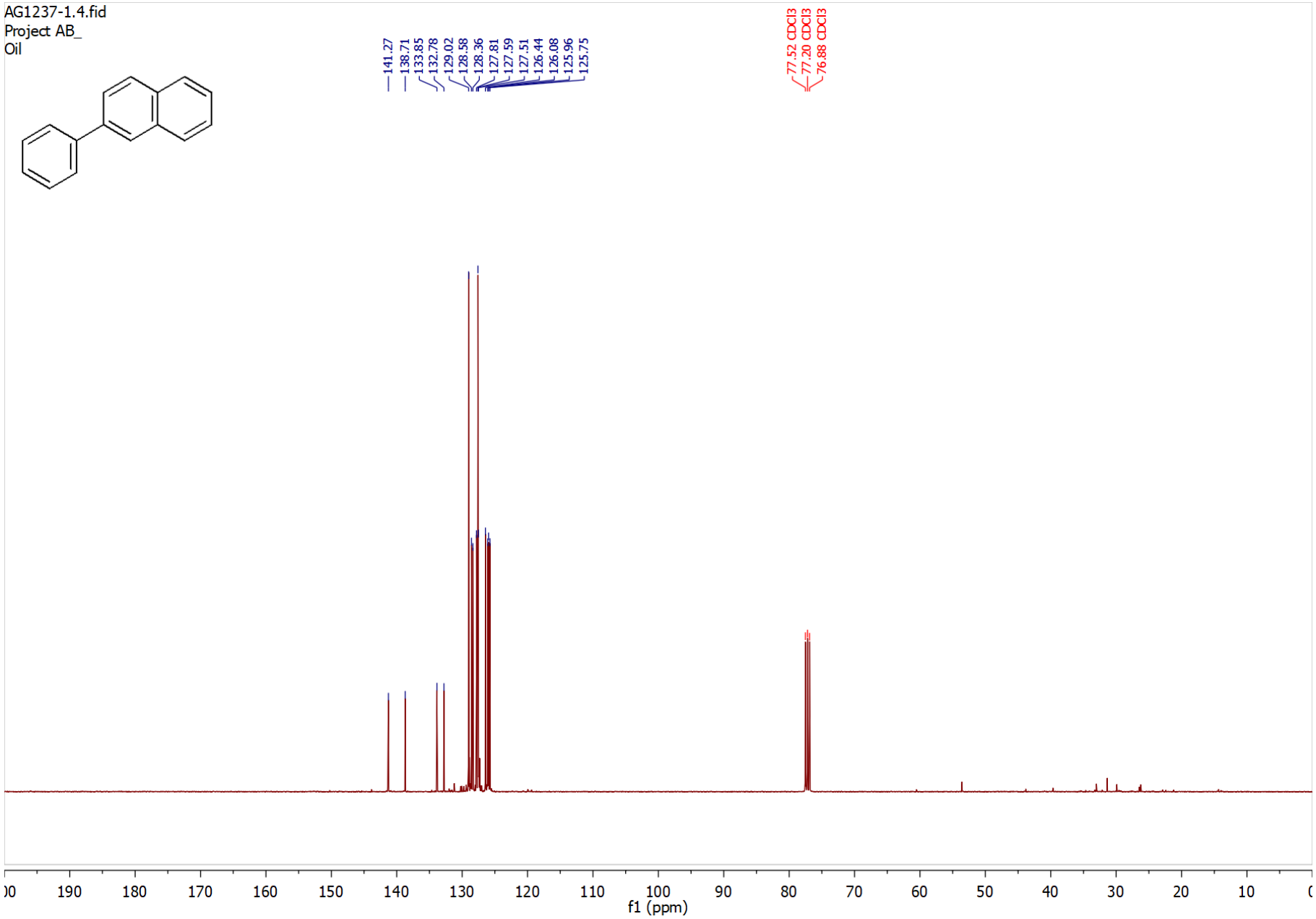
Compound 7j


AG1236.4.fid
Project AB_
Oil
Me
Me
141.64
141.44
138.38
129.06
128.79
127.35
127.23
125.28
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.57
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

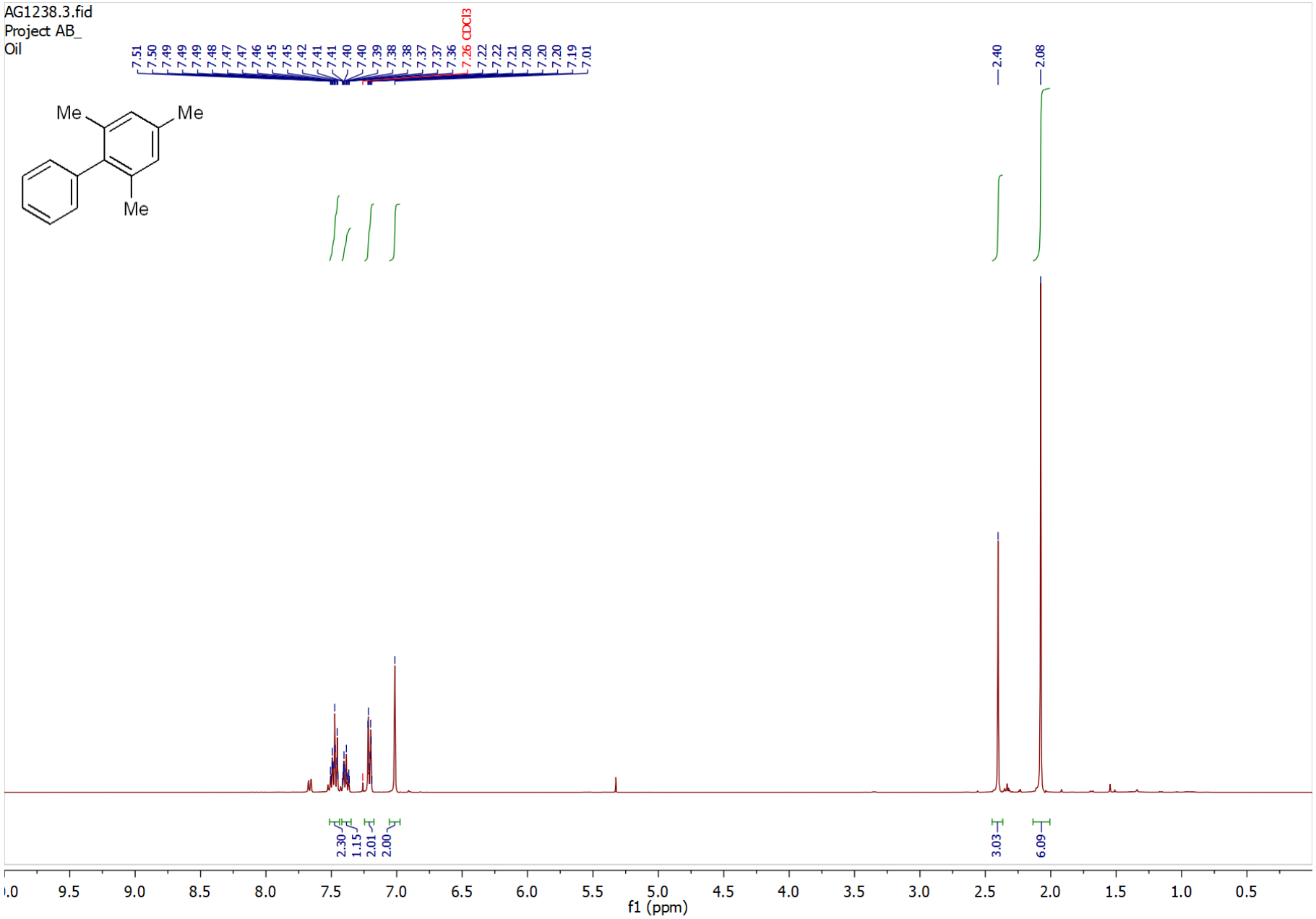
Compound 7k



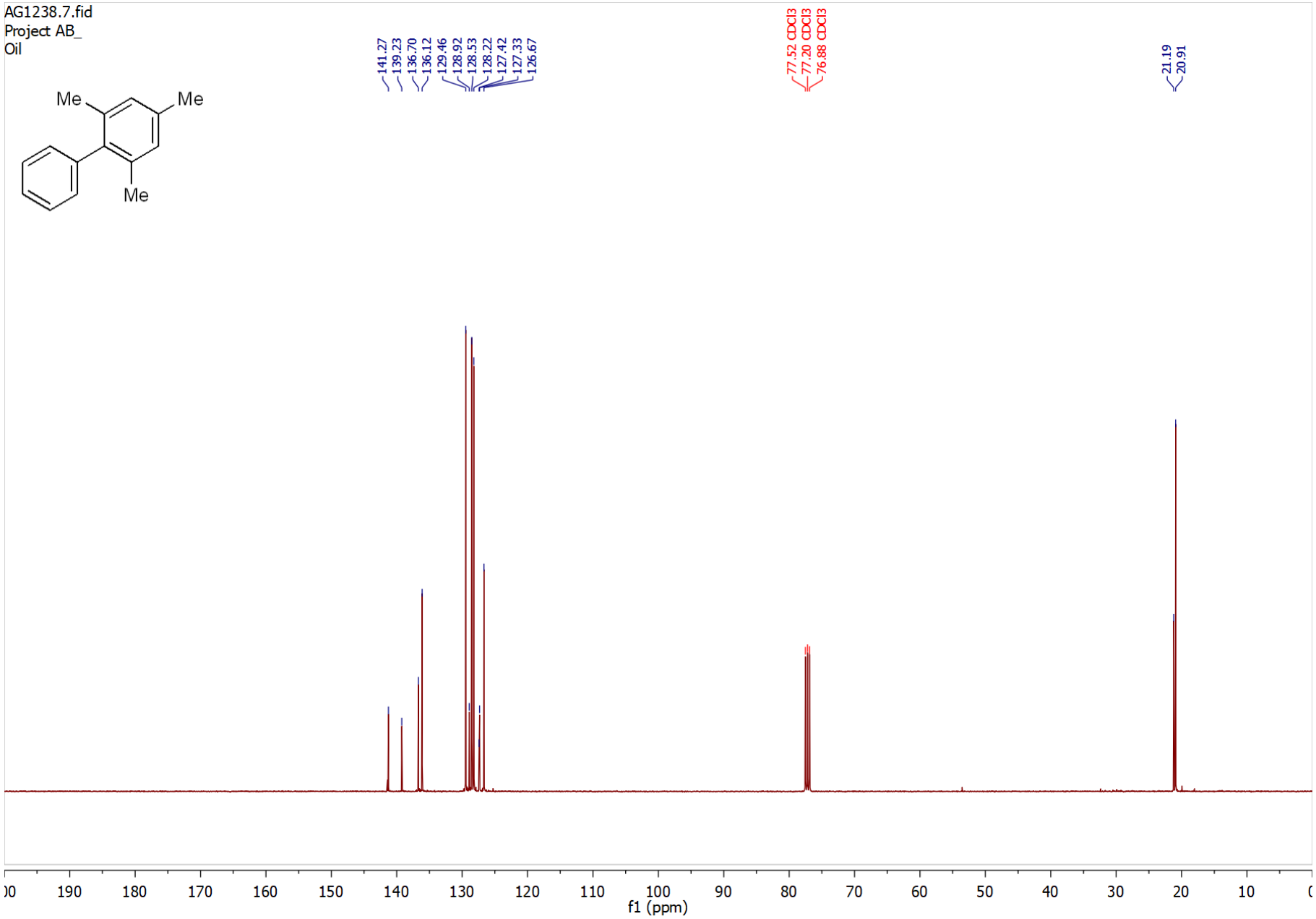
Compound 7k


AG1237-1.4.fid
Project AB_
Oil
141.27
138.71
133.85
132.78
129.02
128.58
128.36
127.81
127.59
127.51
126.44
126.08
125.96
125.75
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

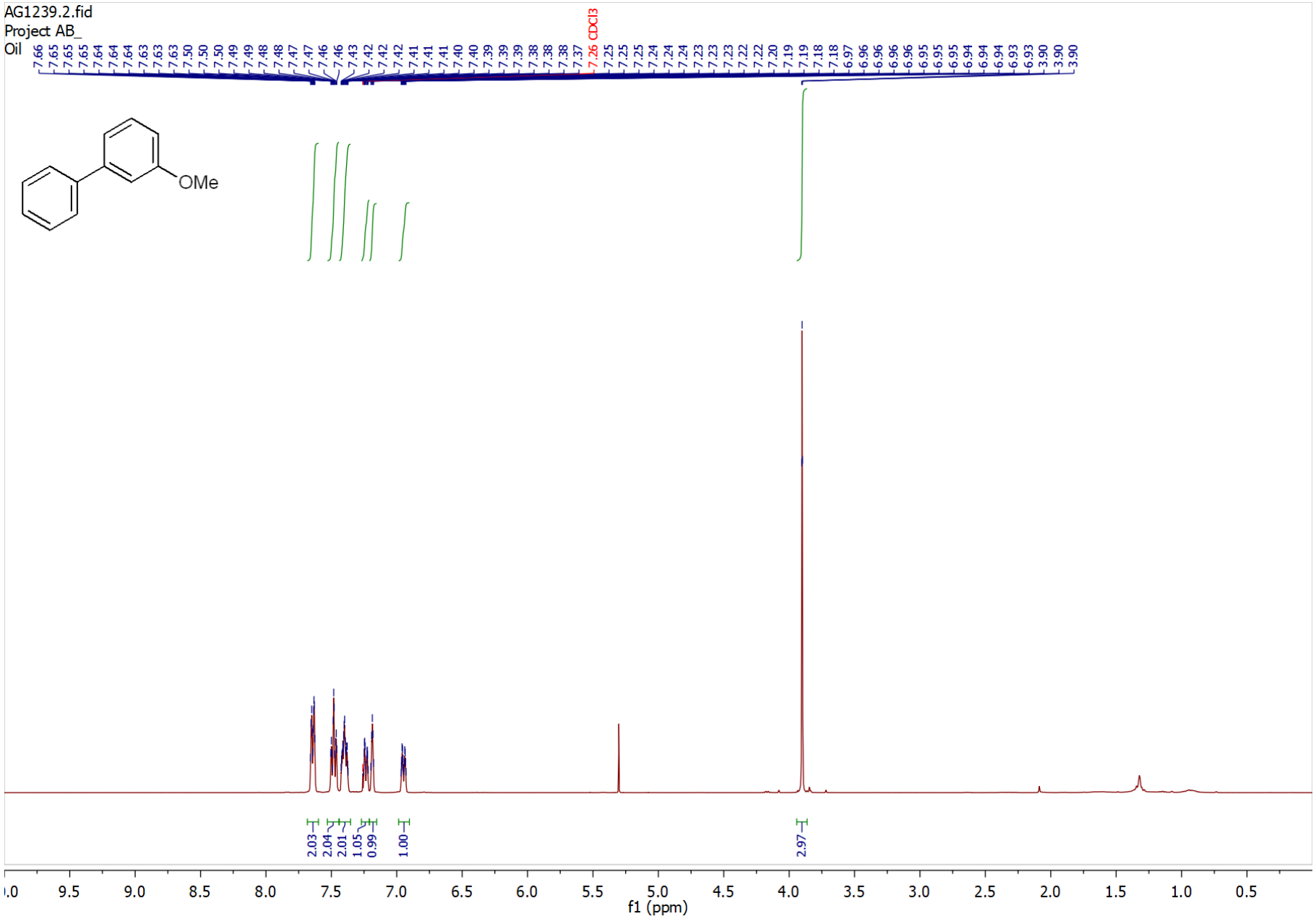
Compound 7l


AG1238.3.fid
Project AB_
Oil
7.51 7.50 7.49 7.49 7.49 7.48 7.47 7.47 7.46 7.45 7.45 7.42 7.41 7.41 7.40 7.40 7.39 7.38 7.38 7.37 7.37 7.36 7.26 CDCl3 7.22 7.22 7.21 7.20 7.20 7.20 7.19 7.01
2.40
2.08
Me
Me
Me
2.30
1.15
2.01
2.00
3.03
6.09
f1 (ppm)

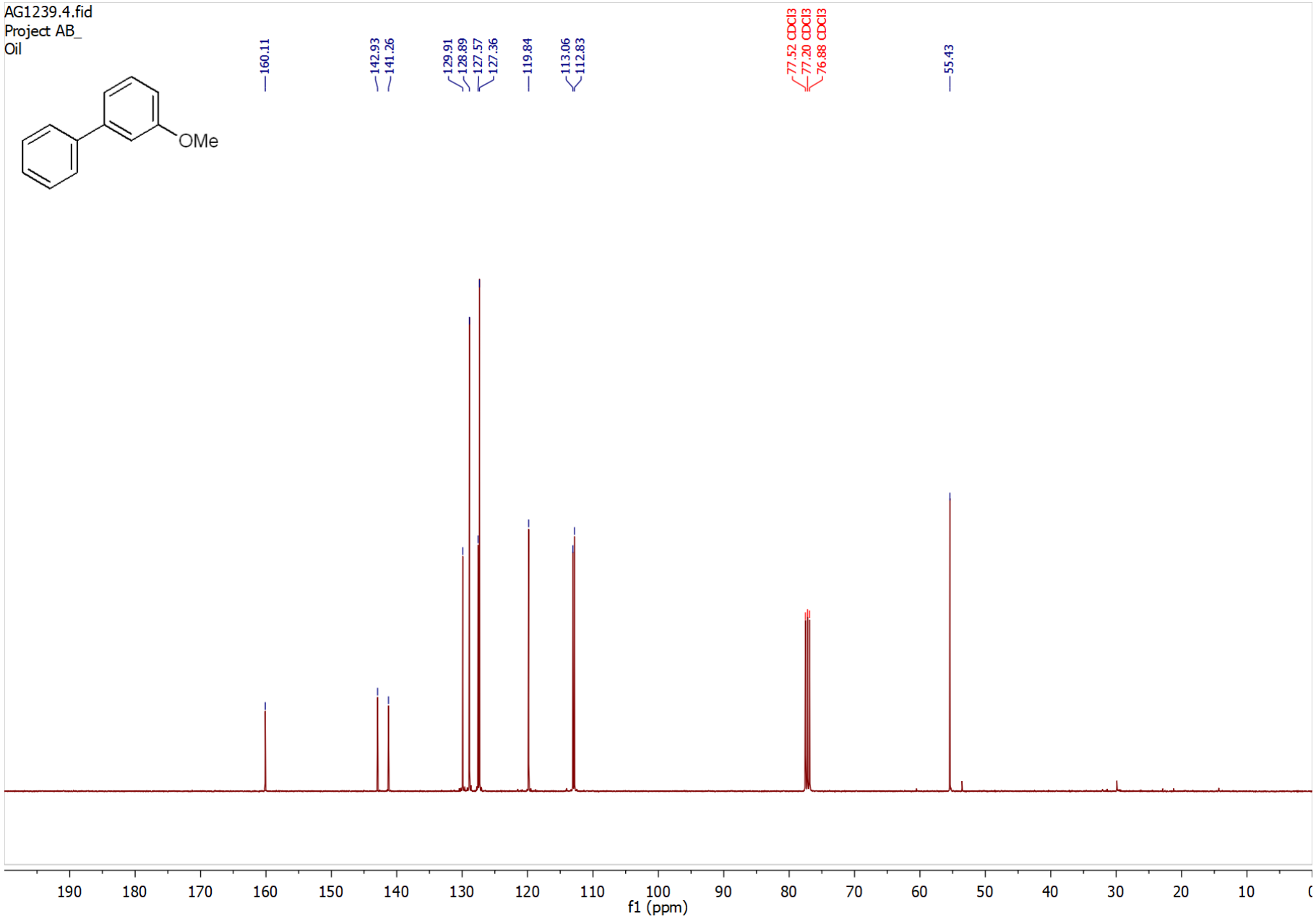
Compound 7l


AG1238.7.fid
Project AB_
Oil
Me
Me
Me
141.27
139.23
136.70
136.12
129.46
128.92
128.53
128.22
127.42
127.33
126.67
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.19
20.91
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

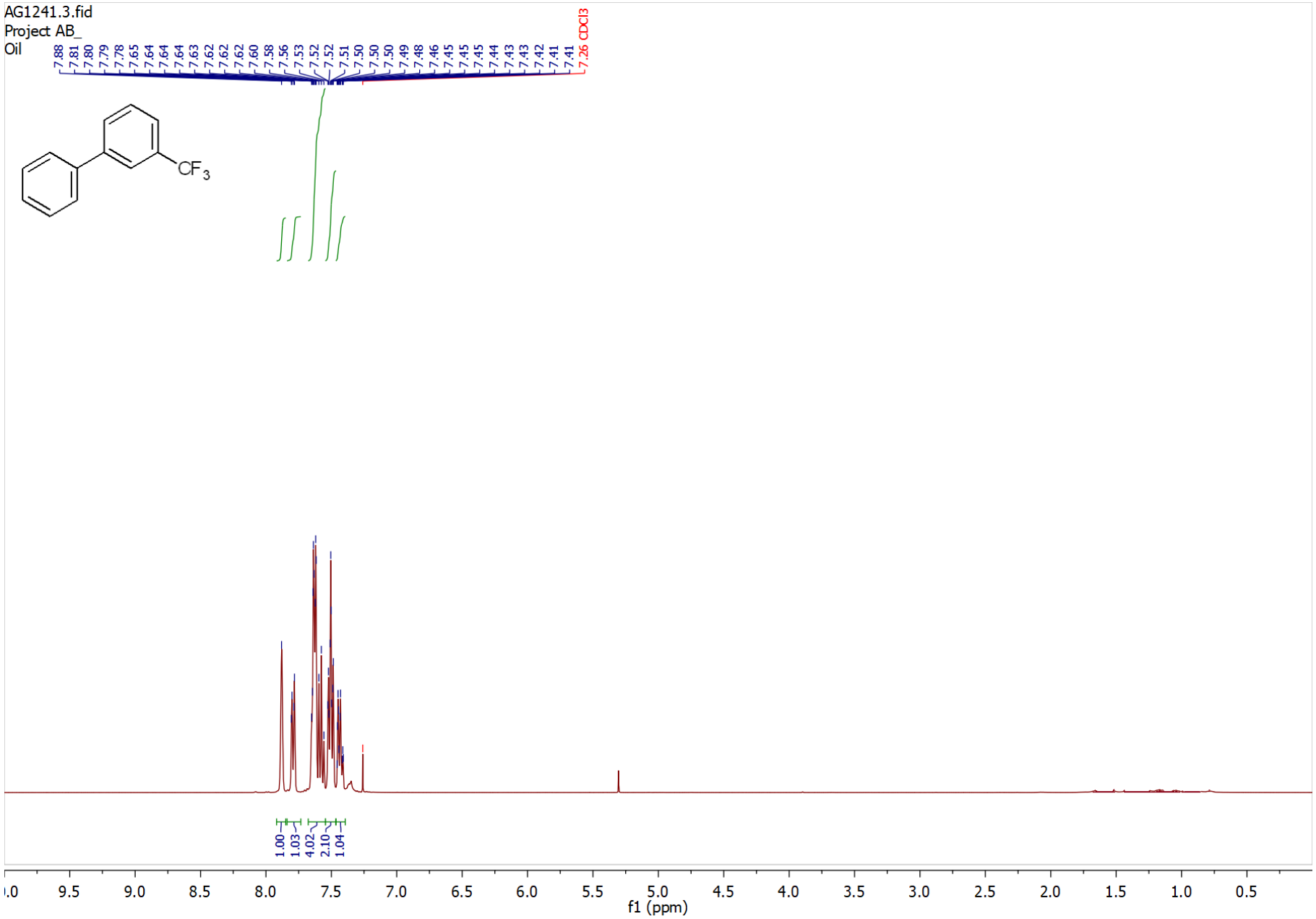
Compound 7m


AG1239.2.fid
Project AB_
Oil
CDCl3
OMe
2.03
2.04
2.01
1.05
0.99
1.00
2.97
f1 (ppm)

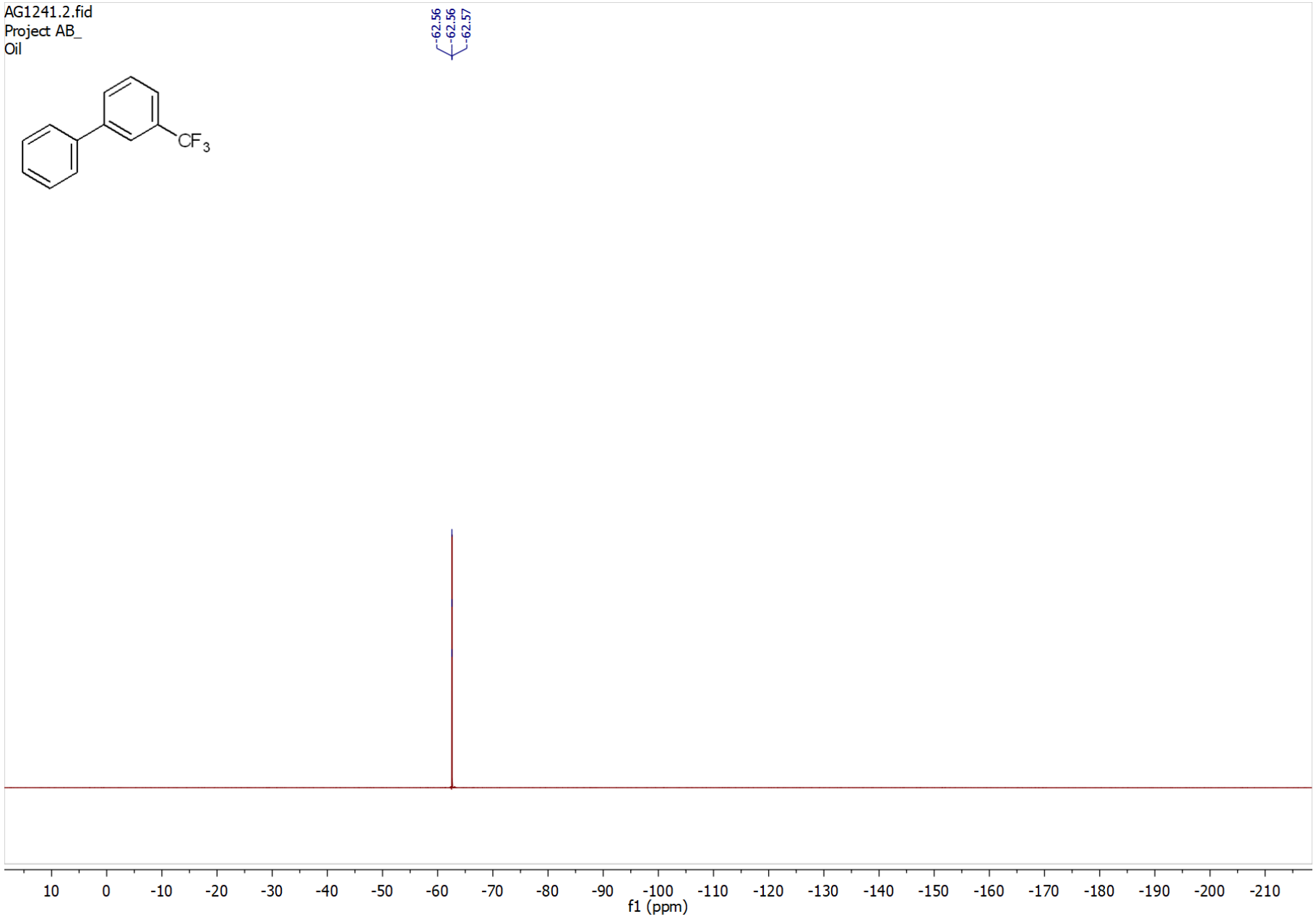
Compound 7m


AG1239.4.fid
Project AB_
Oil
OMe
160.11
142.93
141.26
129.91
128.89
127.57
127.36
119.84
113.06
112.83
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.43
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

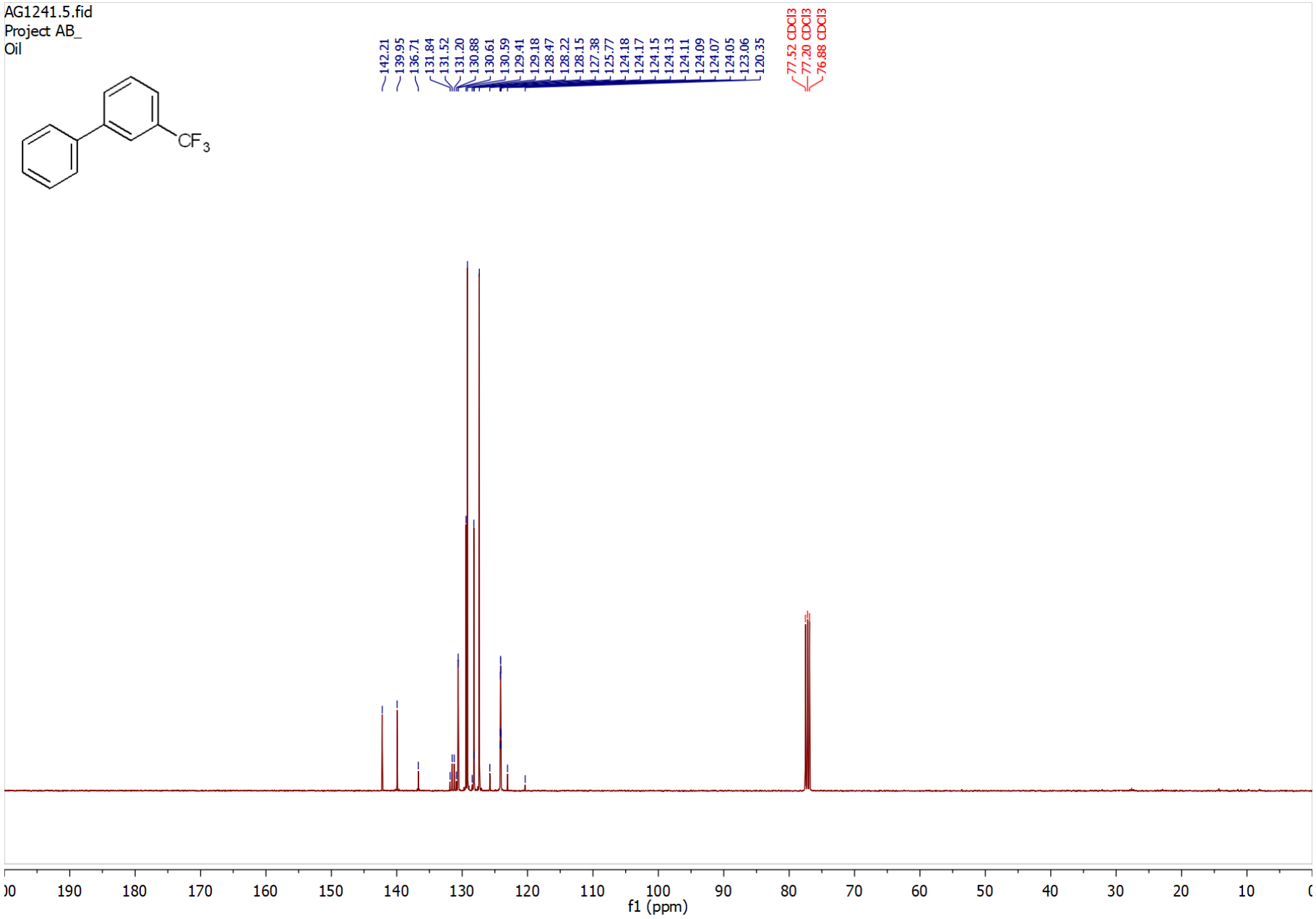
Compound 7n


AG1241.3.fid
Project AB_
Oil
7.88 7.81 7.80 7.79 7.78 7.65 7.64 7.64 7.64 7.63 7.62 7.62 7.62 7.60 7.58 7.56 7.53 7.52 7.52 7.51 7.50 7.50 7.50 7.49 7.48 7.46 7.45 7.45 7.44 7.43 7.43 7.42 7.41 7.41 7.26 CDCl3
CF3
1.00 1.03 4.02 2.10 1.04
f1 (ppm)

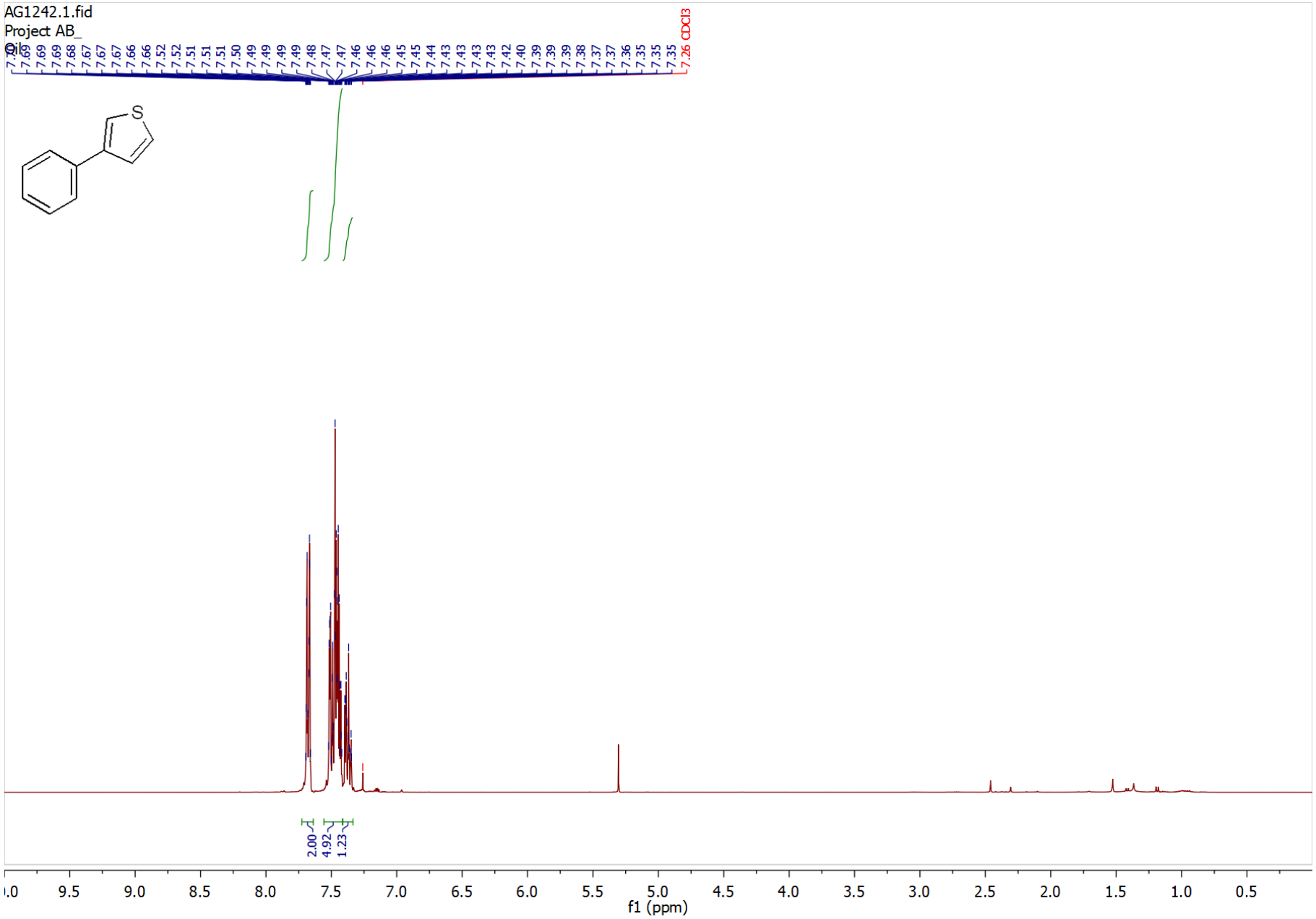
Compound 7n


AG1241.2.fid
Project AB_
Oil
-62.56
-62.56
-62.57
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

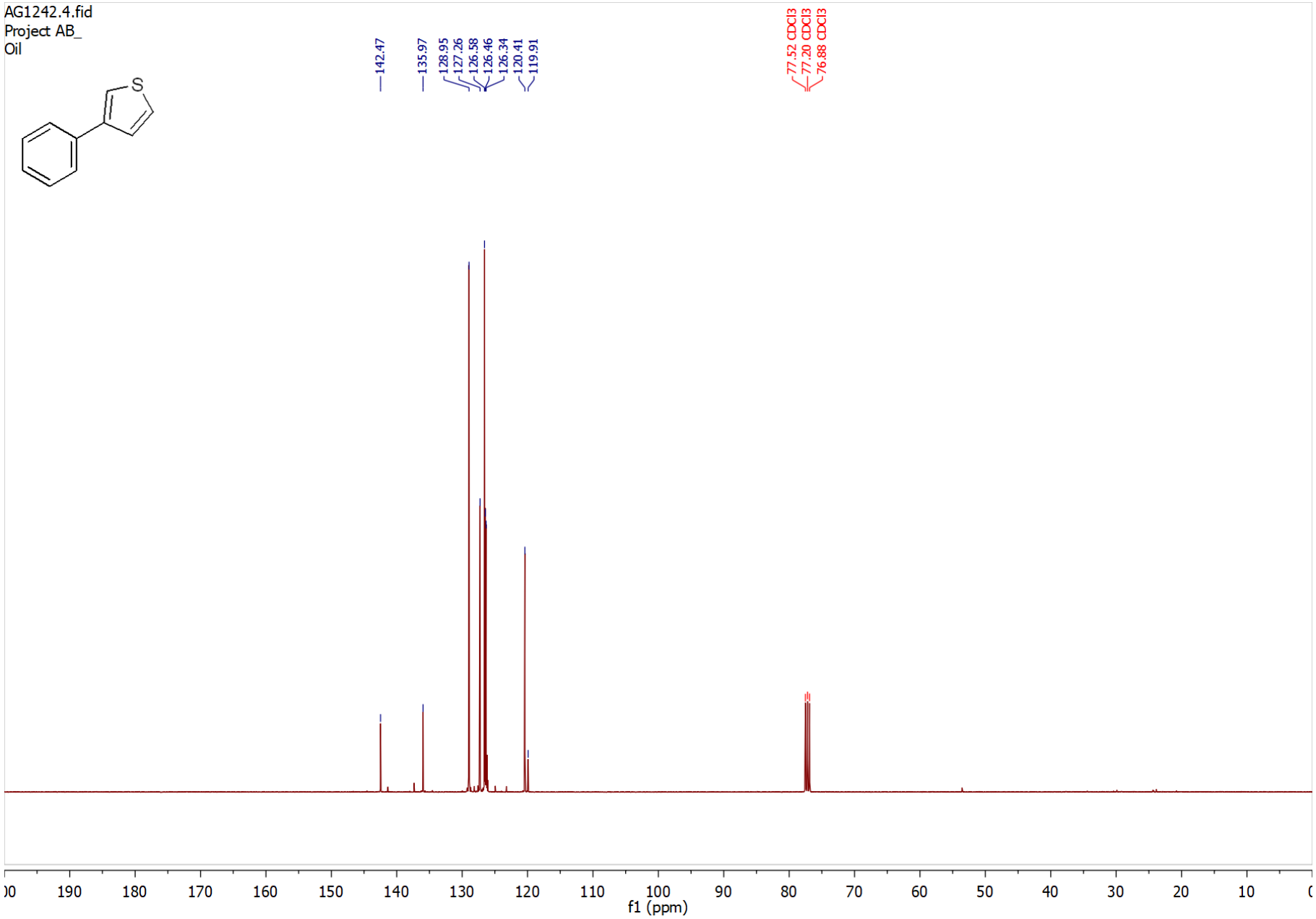
Compound 7n


AG1241.5.fid
Project AB_
Oil
142.21
139.95
136.71
131.84
131.52
131.20
130.88
130.61
130.59
129.41
129.18
128.47
128.22
128.15
127.38
125.77
124.18
124.17
124.15
124.13
124.11
124.09
124.07
124.05
123.06
120.35
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
f1 (ppm)

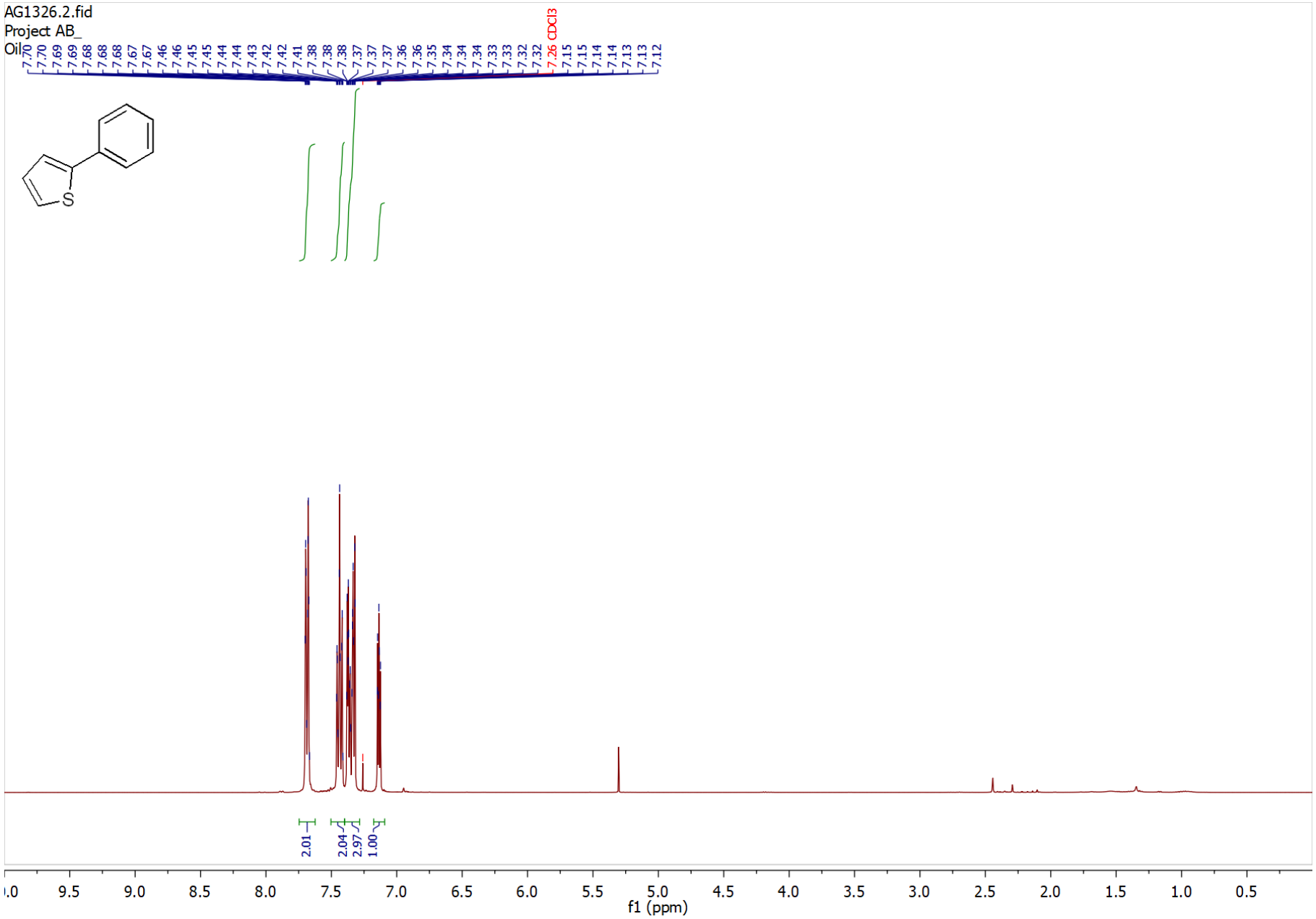
Compound 7o



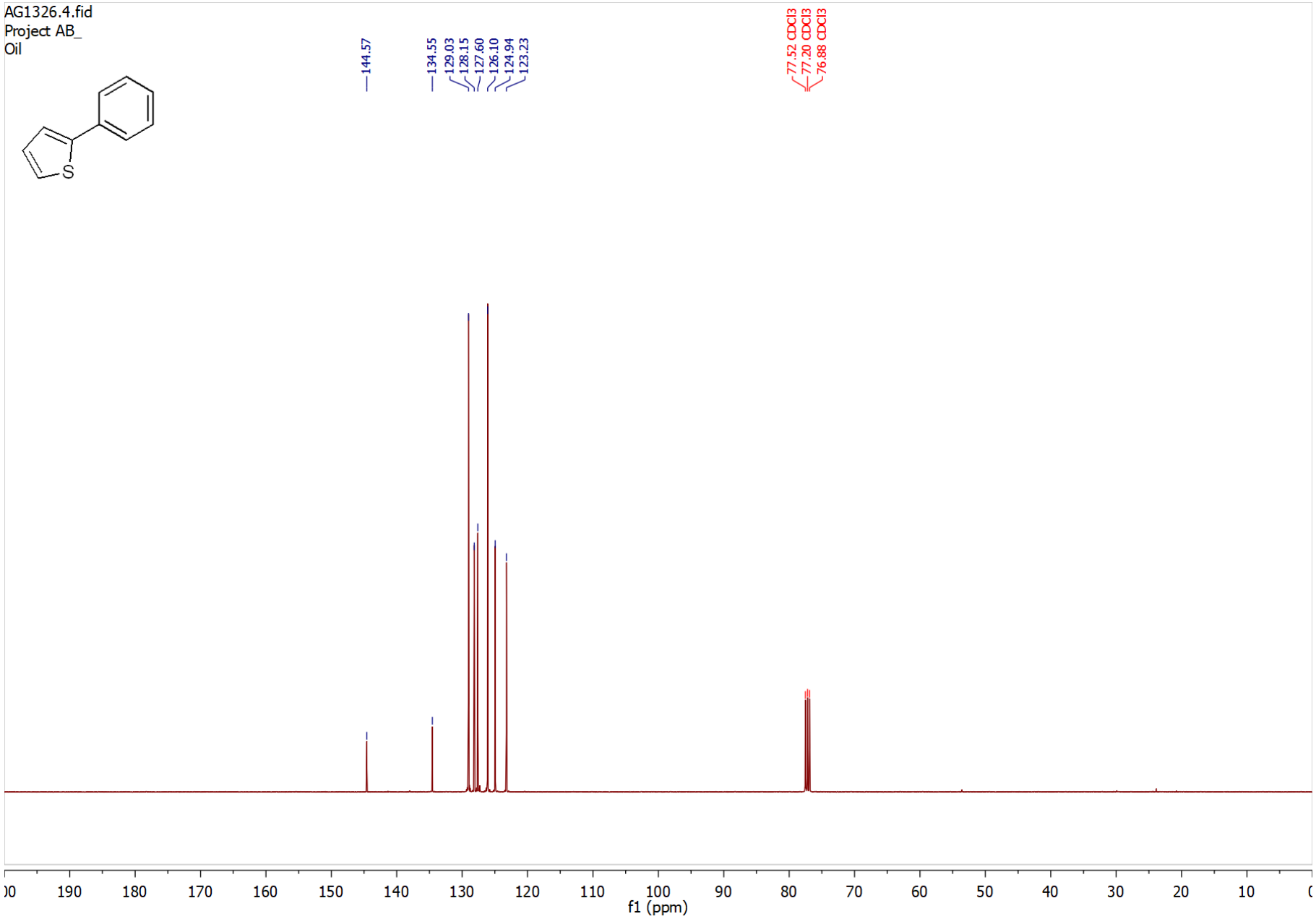
Compound 7o


AG1242.4.fid
Project AB_
Oil
S
142.47
135.97
128.95
127.26
126.58
126.46
126.34
120.41
119.91
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

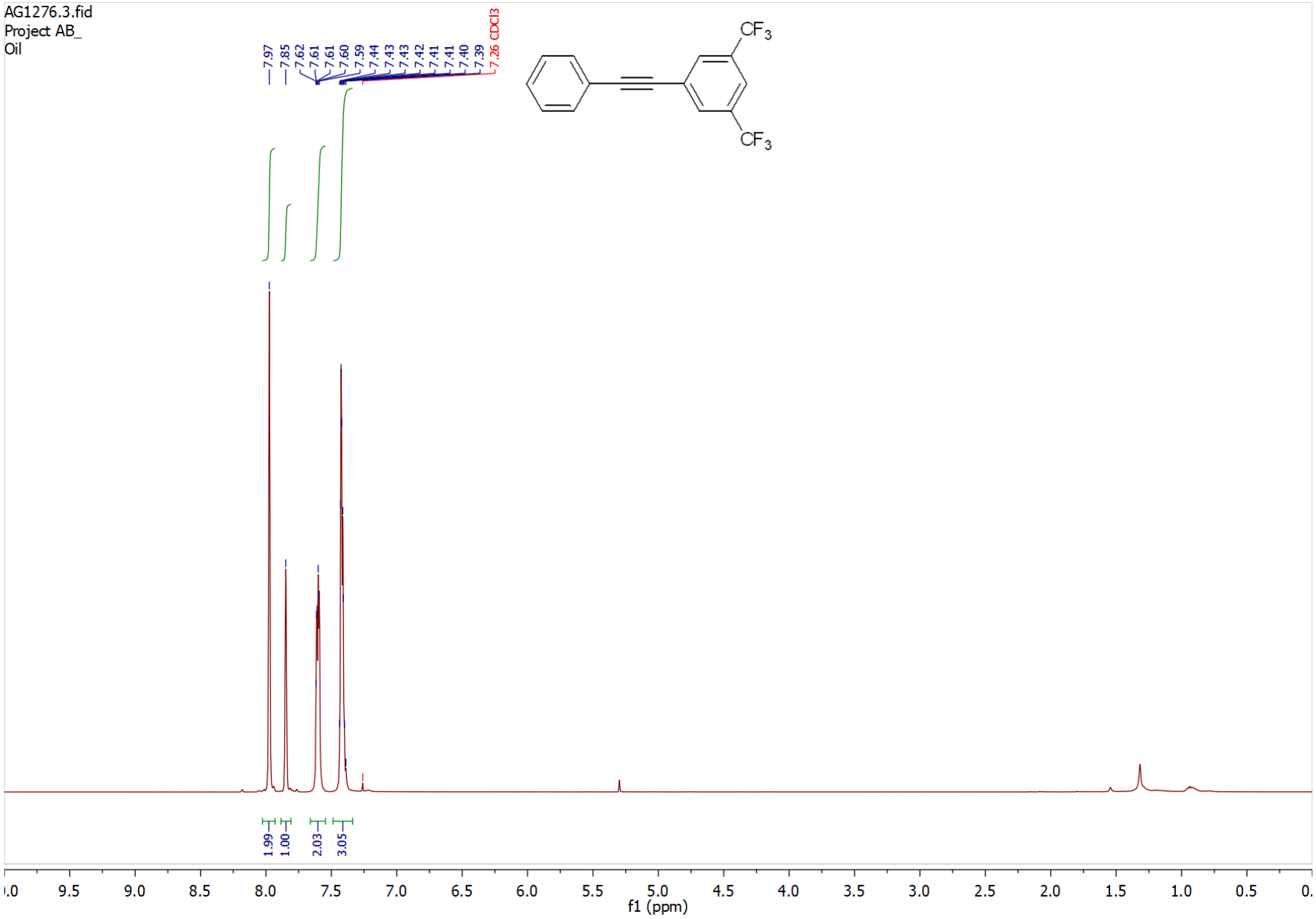
Compound 7p


AG1326.2.fid
Project AB_
Oil
7.70 7.70 7.69 7.69 7.68 7.68 7.68 7.67 7.67 7.46 7.46 7.45 7.45 7.44 7.44 7.43 7.42 7.42 7.41 7.38 7.38 7.38 7.37 7.37 7.37 7.36 7.36 7.35 7.34 7.34 7.34 7.33 7.33 7.32 7.32 7.26 CDCl3 7.15 7.15 7.14 7.14 7.13 7.13 7.12
S
2.01
2.04
2.97
1.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
f1 (ppm)

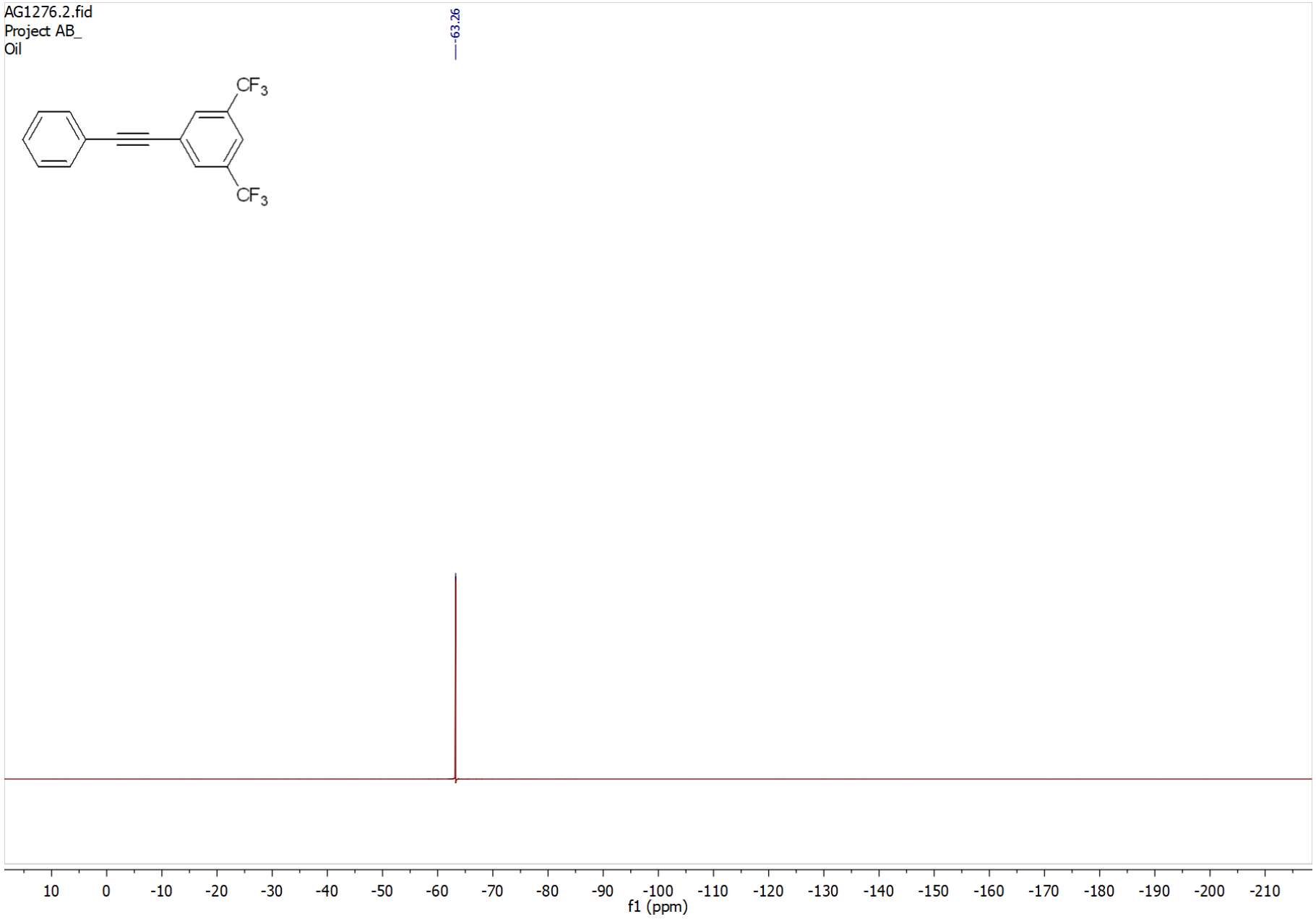
Compound 7p


AG1326.4.fid
Project AB_
Oil
144.57
134.55
129.03
128.15
127.60
126.10
124.94
123.23
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
S
f1 (ppm)

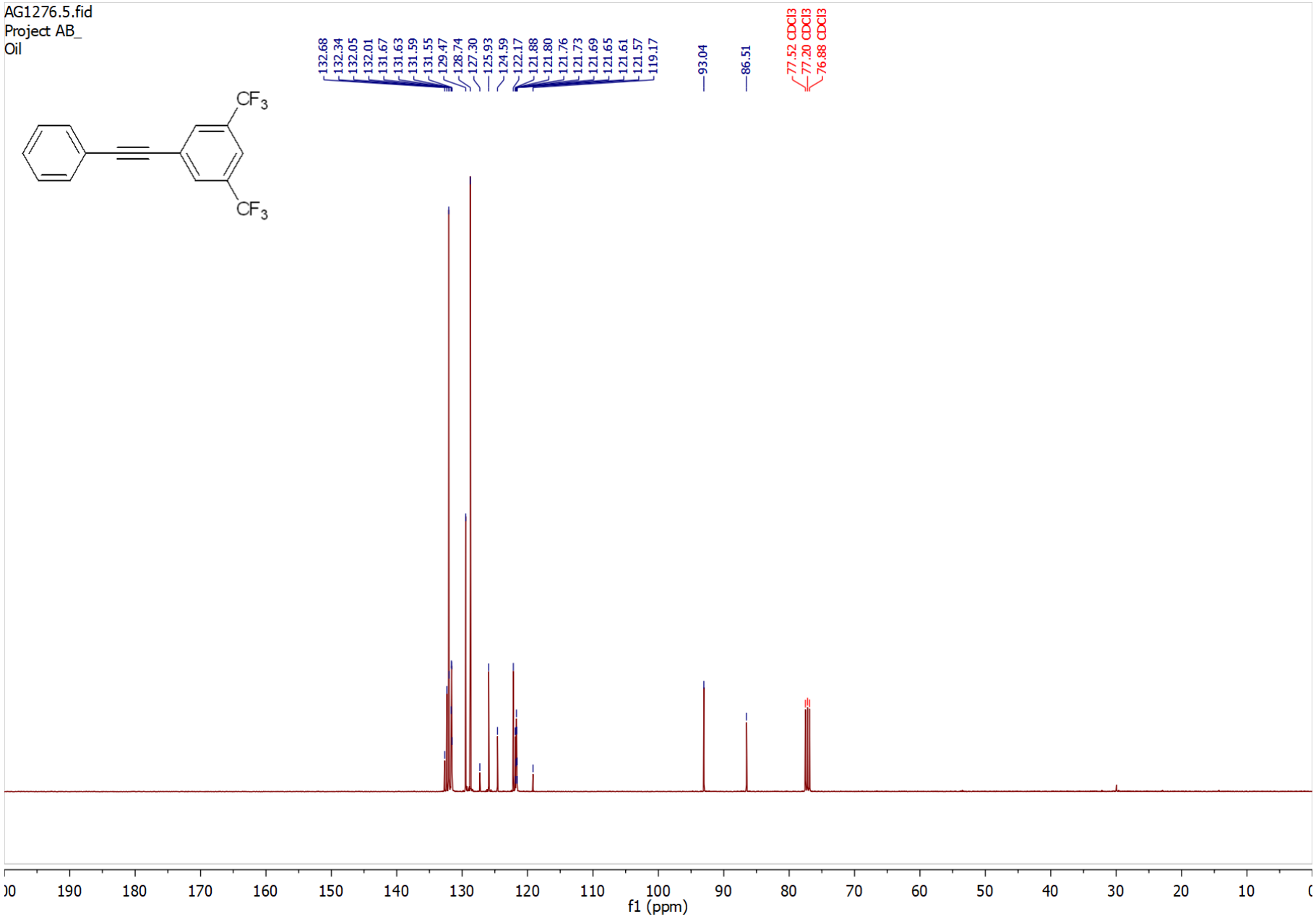
Compound 9a


AG1276.3.fid
Project AB_
Oil
7.97
7.85
7.62
7.61
7.61
7.60
7.59
7.44
7.43
7.43
7.42
7.41
7.41
7.40
7.39
7.26 CDCl3
CF3
CF3
1.99
1.00
2.03
3.05
f1 (ppm)

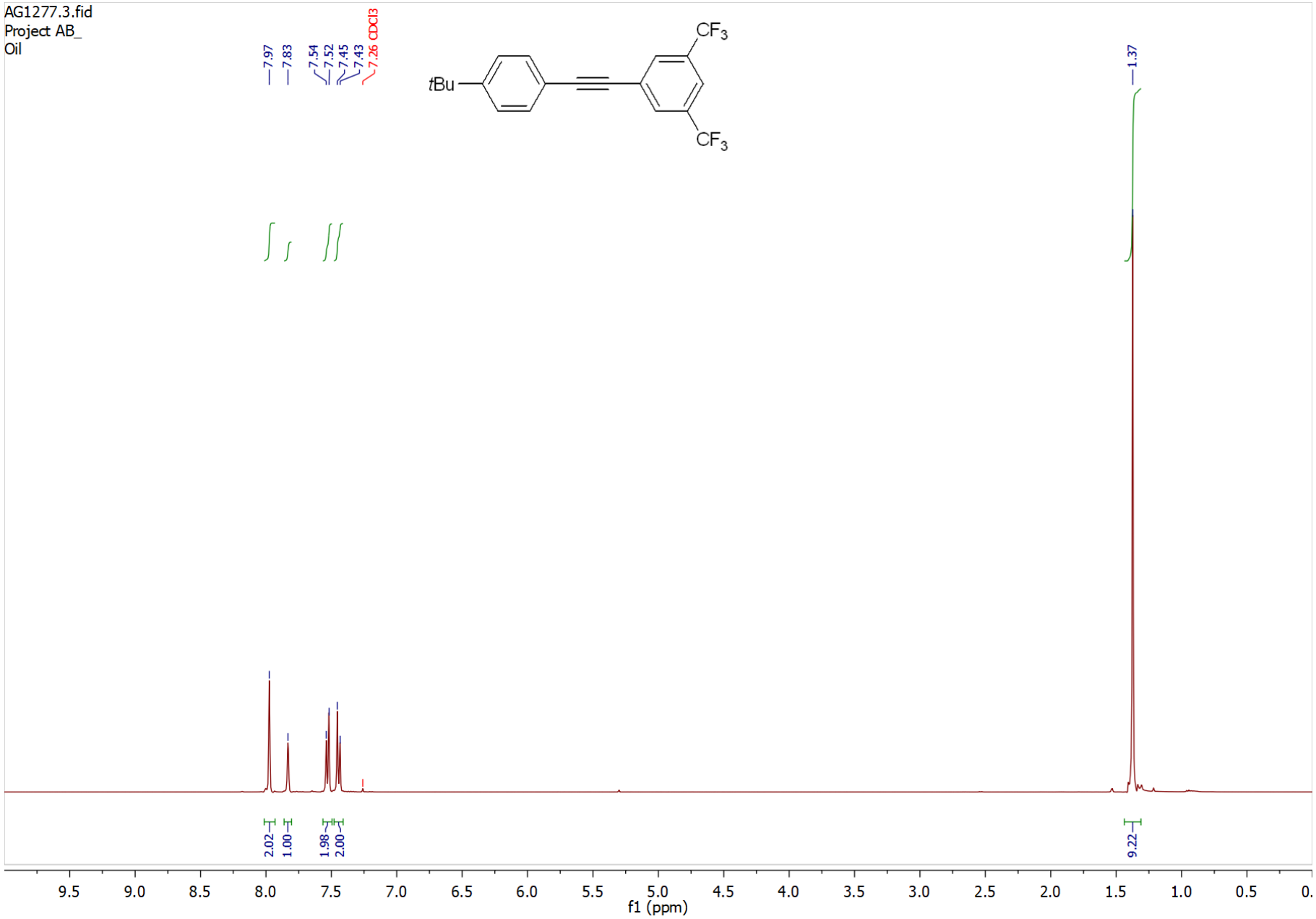
Compound 9a


AG1276.2.fid
Project AB_
Oil
63.26
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

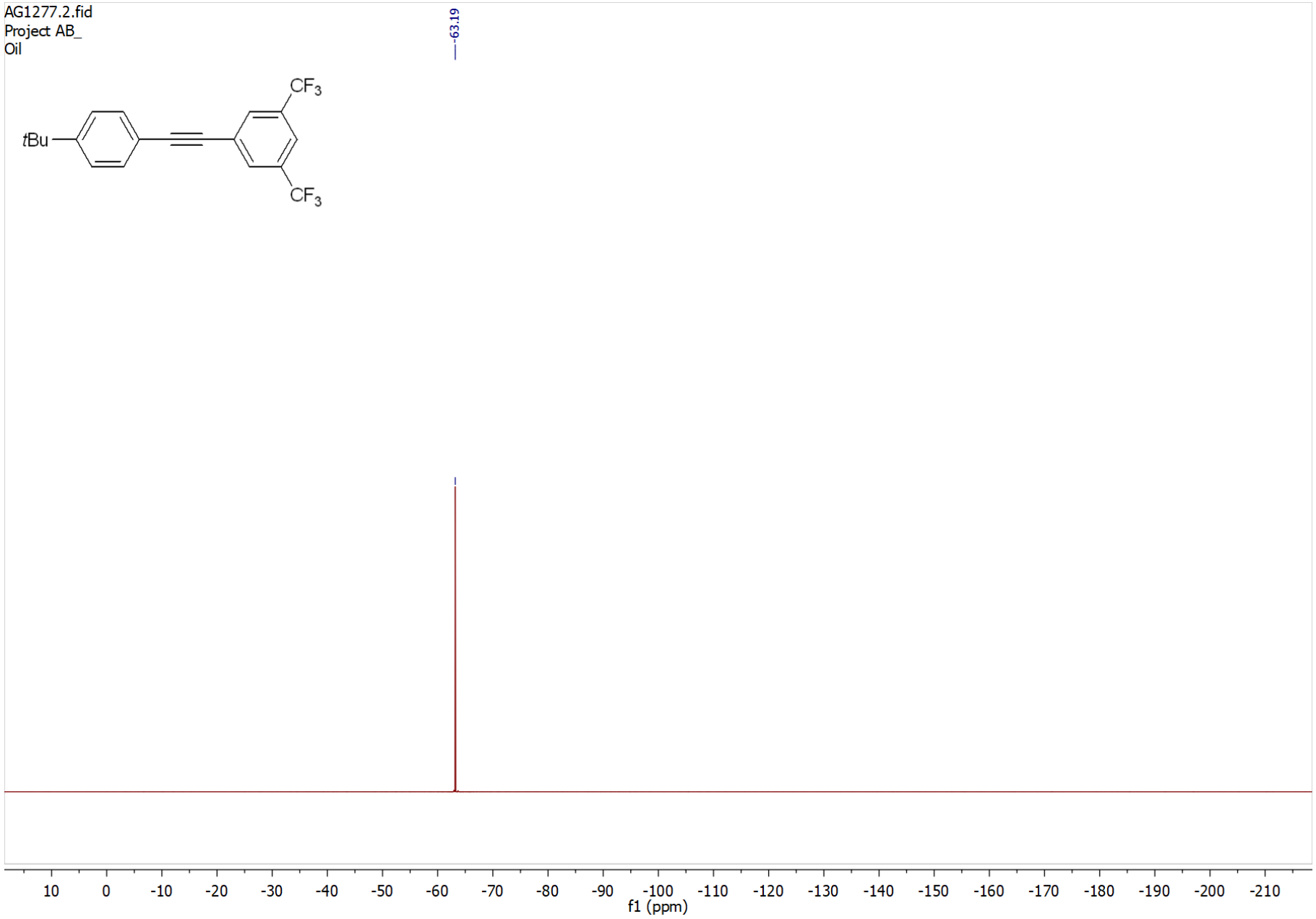
Compound 9a


AG1276.5.fid
Project AB_
Oil
132.68
132.34
132.05
132.01
131.67
131.63
131.59
131.55
129.47
128.74
127.30
125.93
124.59
122.17
121.88
121.80
121.76
121.73
121.69
121.65
121.61
121.57
119.17
93.04
86.51
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
CF3
CF3
f1 (ppm)

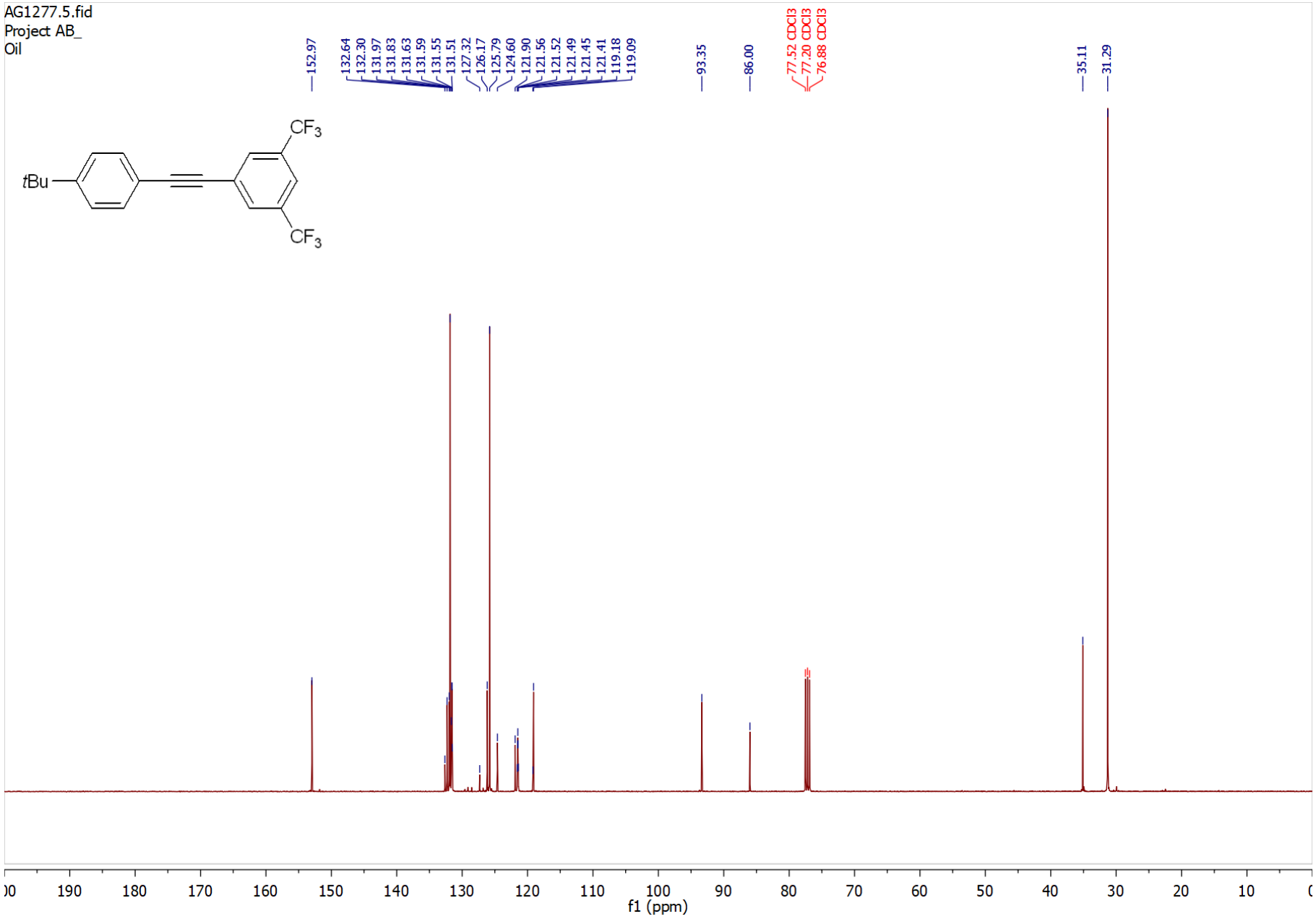
Compound 9b


AG1277.3.fid
Project AB_
Oil
7.97
7.83
7.54
7.52
7.45
7.43
7.26 CDCl3
tBu
CF3
CF3
1.37
2.02
1.00
1.98
2.00
9.22
f1 (ppm)

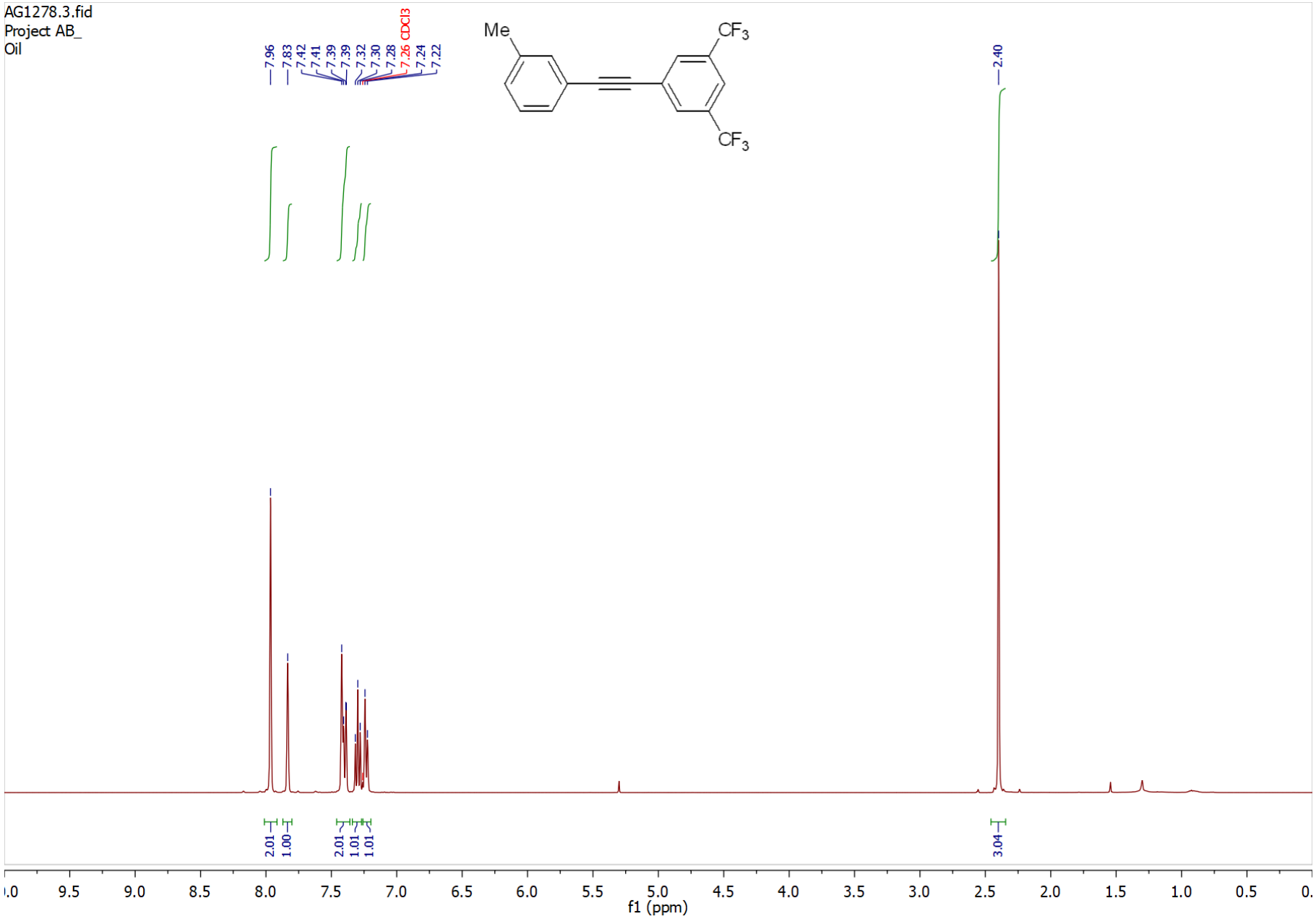
Compound 9b


AG1277.2.fid
Project AB_
Oil
63.19
tBu
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

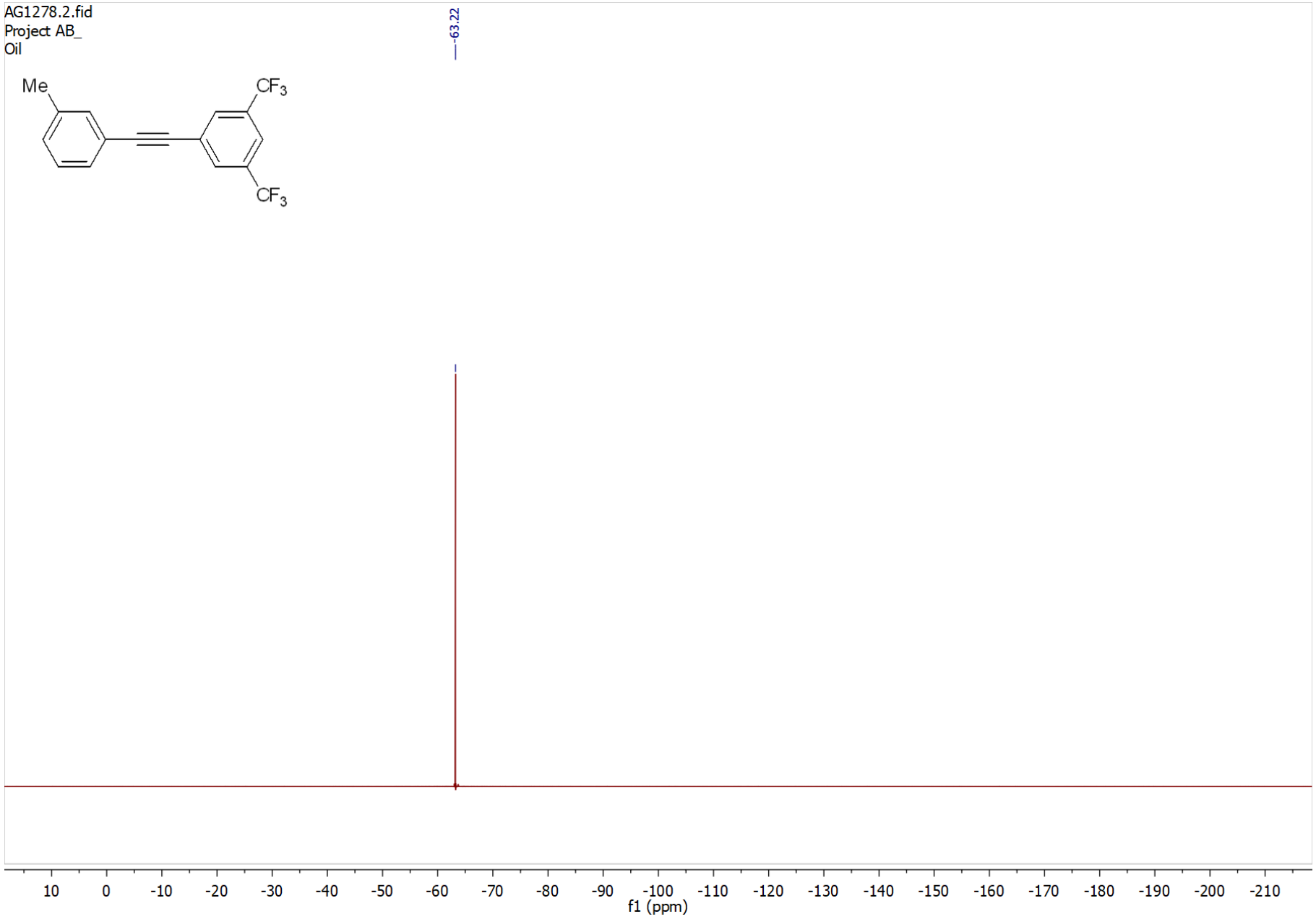
Compound 9b


AG1277.5.fid
Project AB_
Oil
152.97
132.64
132.30
131.97
131.83
131.63
131.59
131.55
131.51
127.32
126.17
125.79
124.60
121.90
121.56
121.52
121.49
121.45
121.41
119.18
119.09
93.35
86.00
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
35.11
31.29
tBu
CF3
CF3
f1 (ppm)

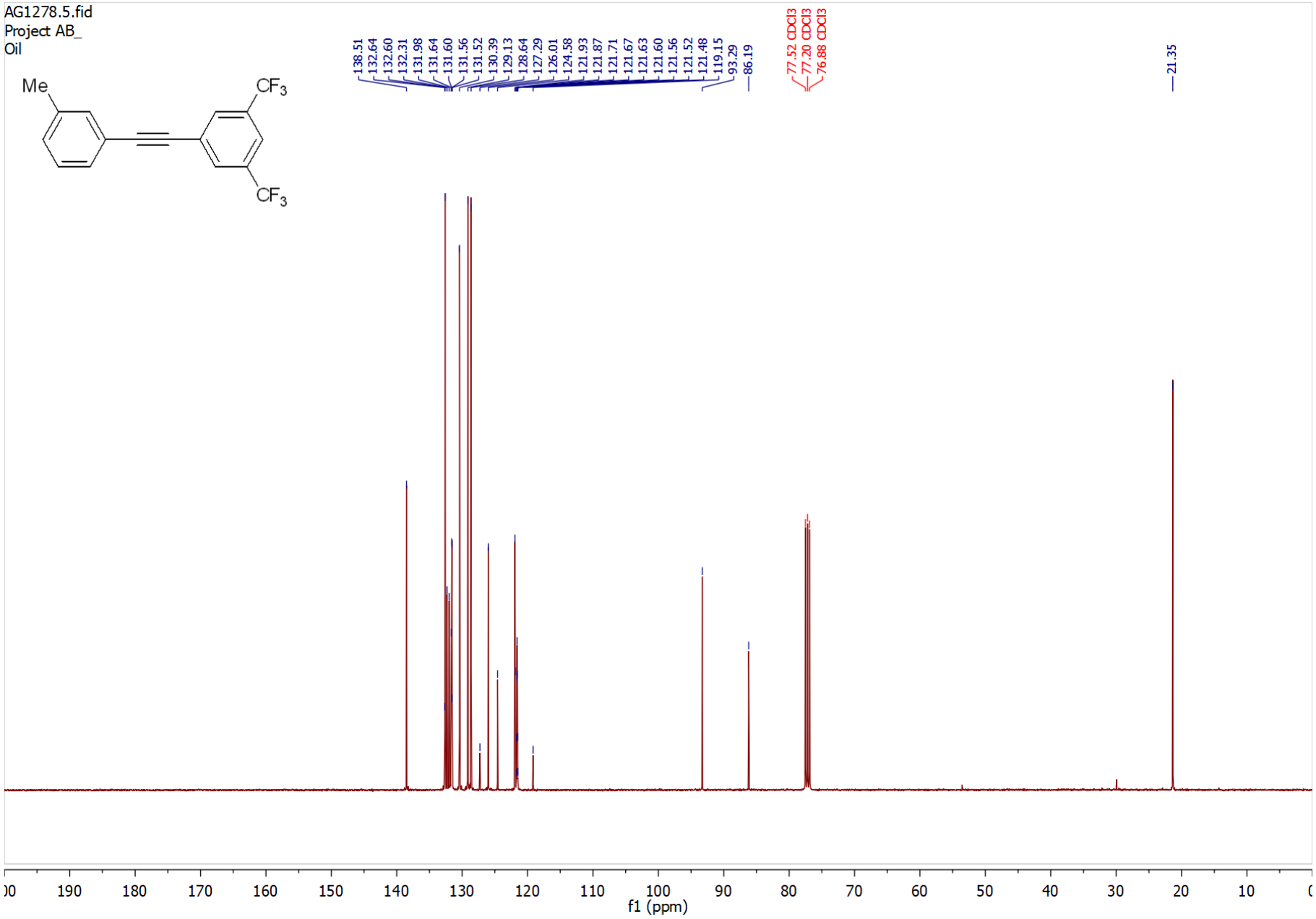
Compound 9c


AG1278.3.fid
Project AB_
Oil
7.96
7.83
7.42
7.41
7.39
7.39
7.32
7.30
7.28
7.26 CDCl3
7.24
7.22
2.40
Me
CF3
CF3
2.01
1.00
2.01
1.01
1.01
3.04
f1 (ppm)

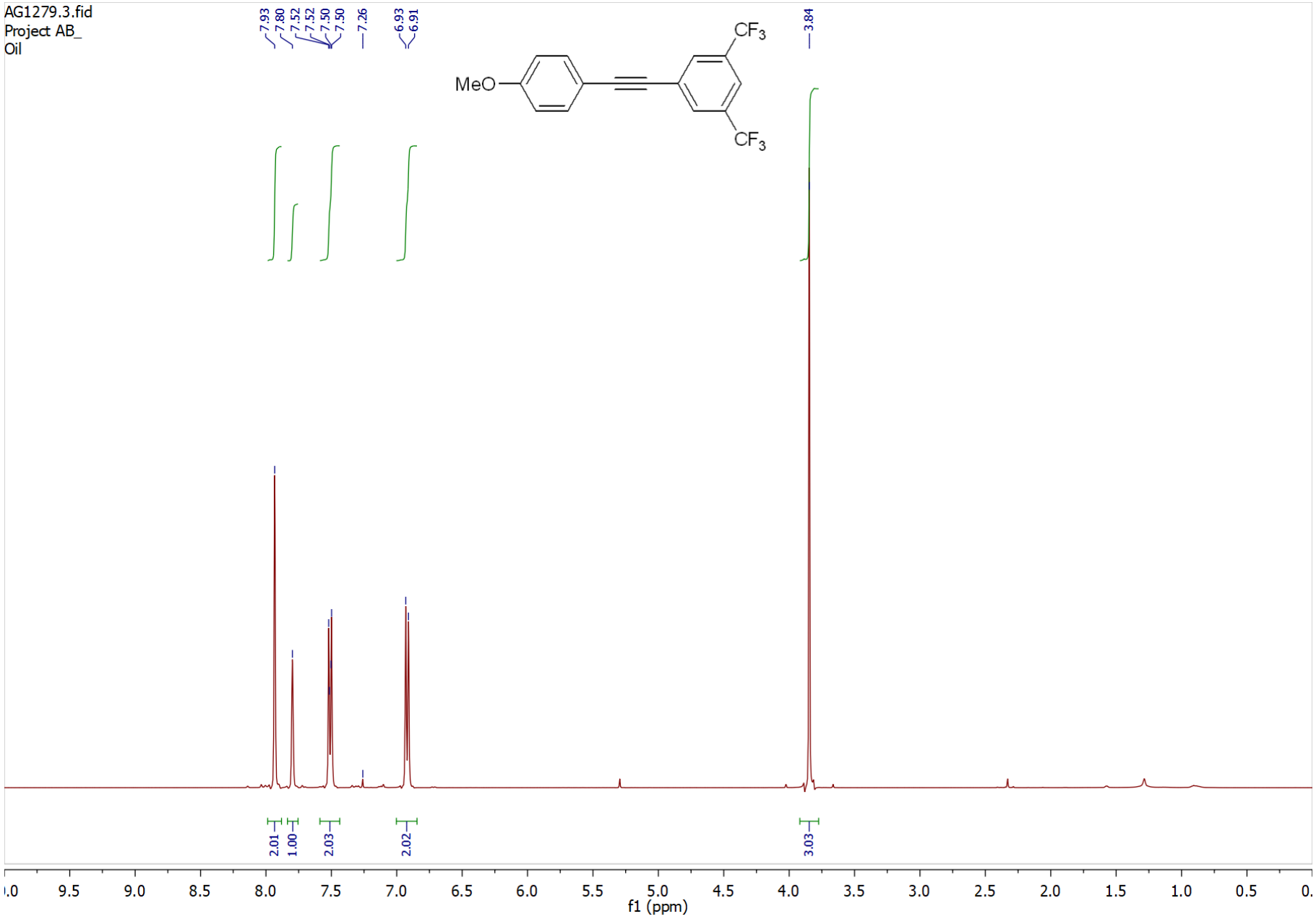
Compound 9c


AG1278.2.fid
Project AB_
Oil
63.22
Me
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

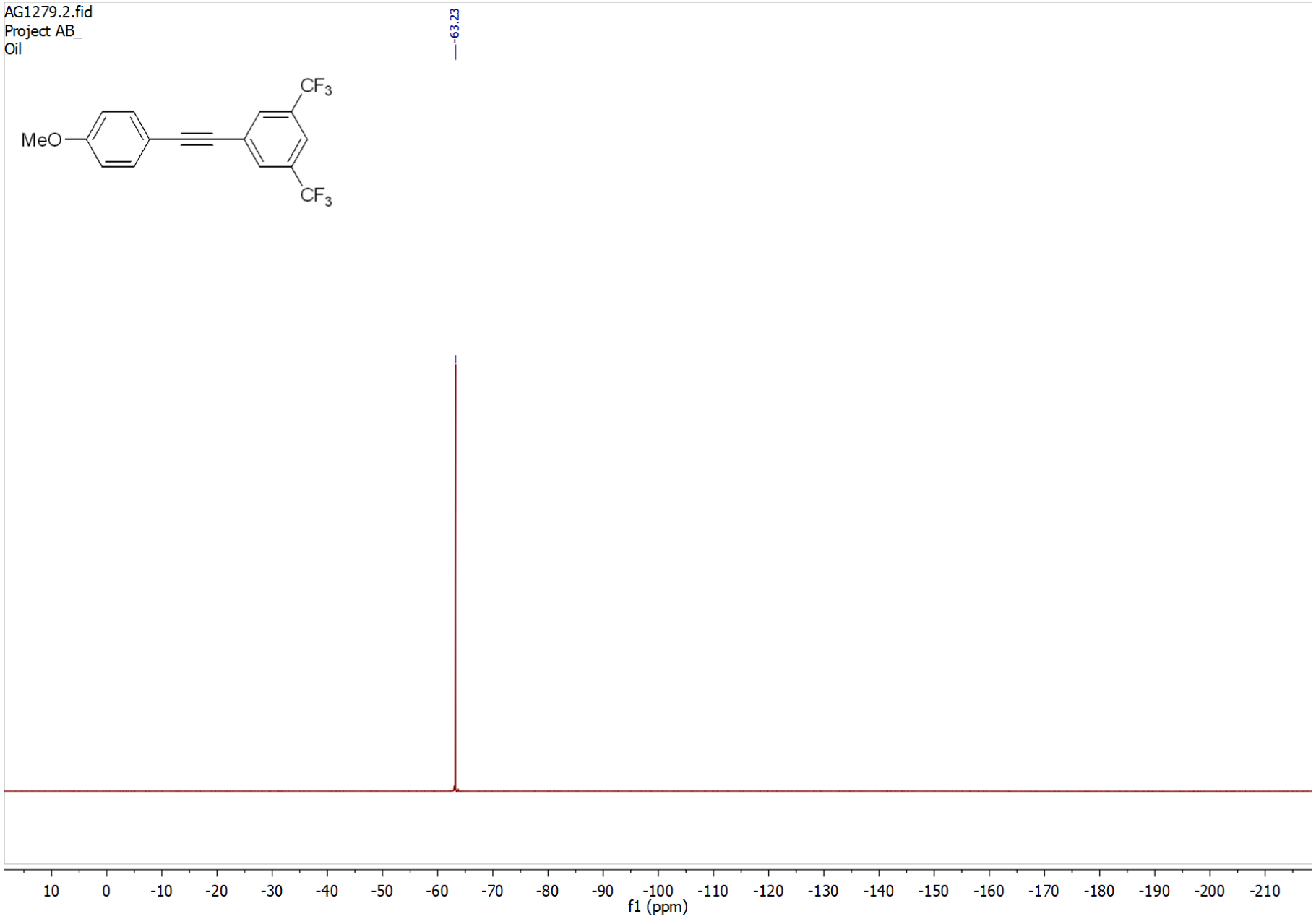
Compound 9c


AG1278.5.fid
Project AB_
Oil
Me
CF3
CF3
138.51
132.64
132.60
132.31
131.98
131.64
131.60
131.56
131.52
130.39
129.13
128.64
127.29
126.01
124.58
121.93
121.87
121.71
121.67
121.63
121.60
121.56
121.52
121.48
119.15
93.29
86.19
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
21.35
f1 (ppm)

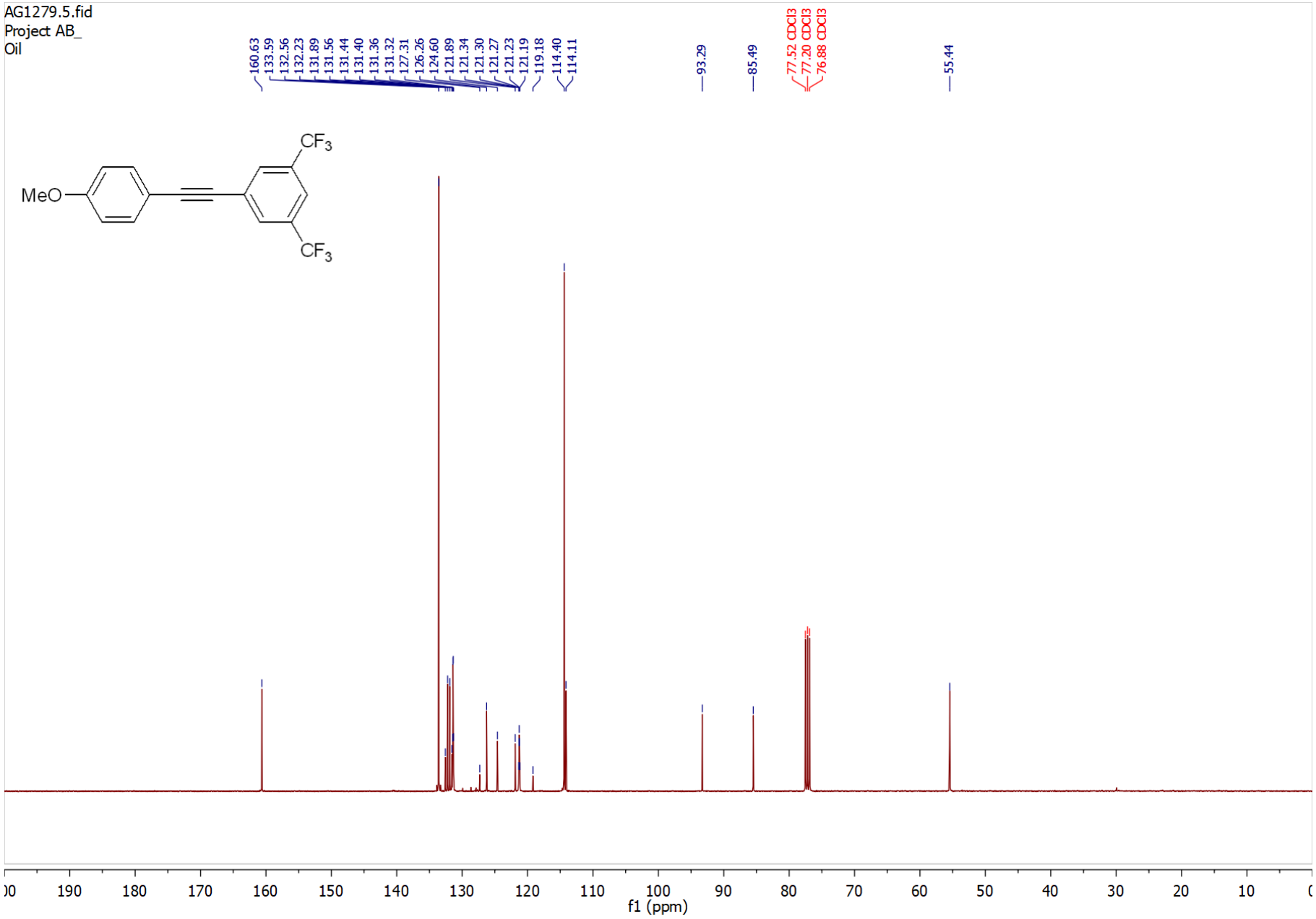
Compound 9d


AG1279.3.fid
Project AB_
Oil
7.93
7.80
7.52
7.52
7.50
7.50
7.26
6.93
6.91
3.84
MeO
CF3
CF3
2.01
1.00
2.03
2.02
3.03
f1 (ppm)

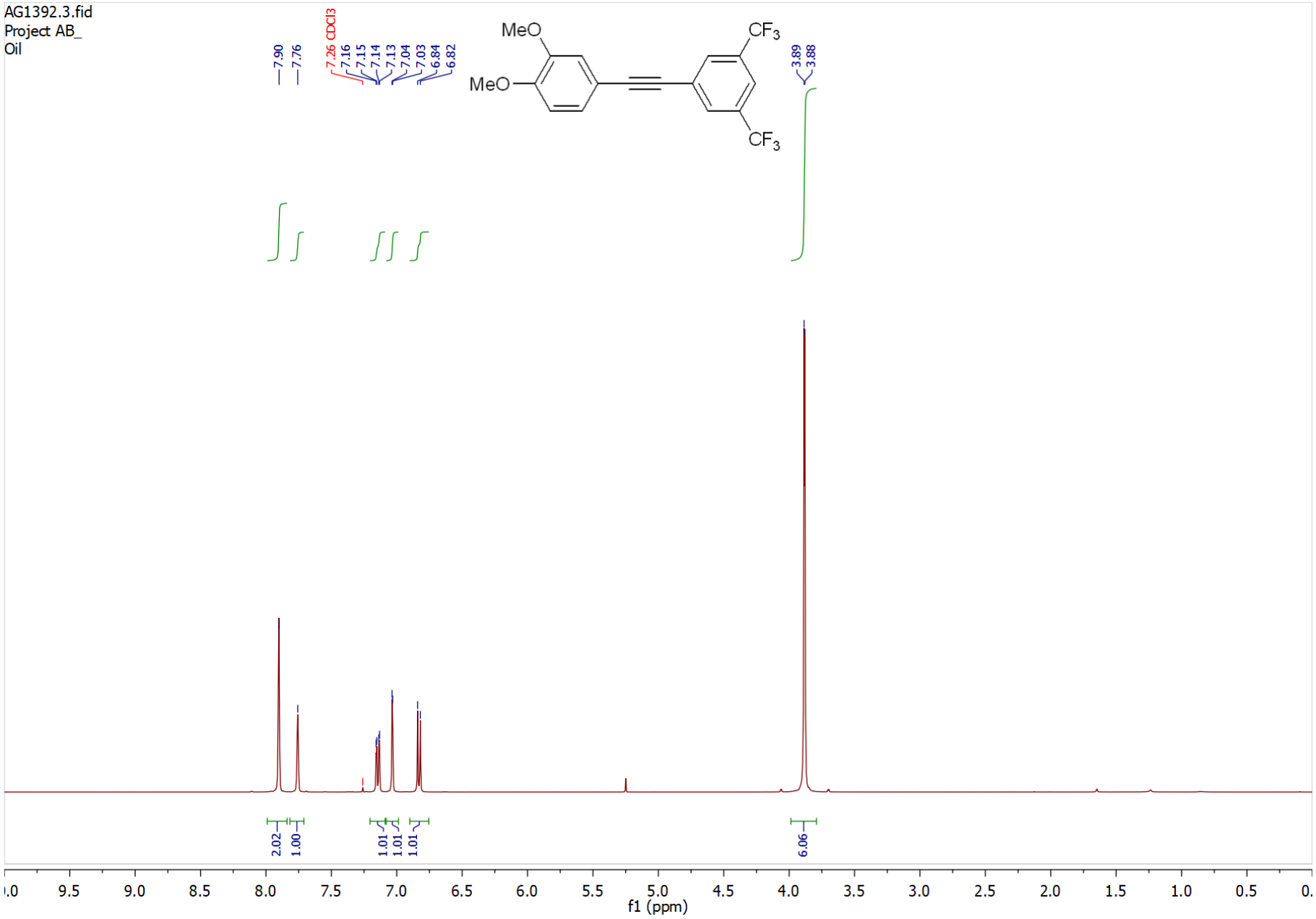
Compound 9d


AG1279.2.fid
Project AB_
Oil
63.23
MeO
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

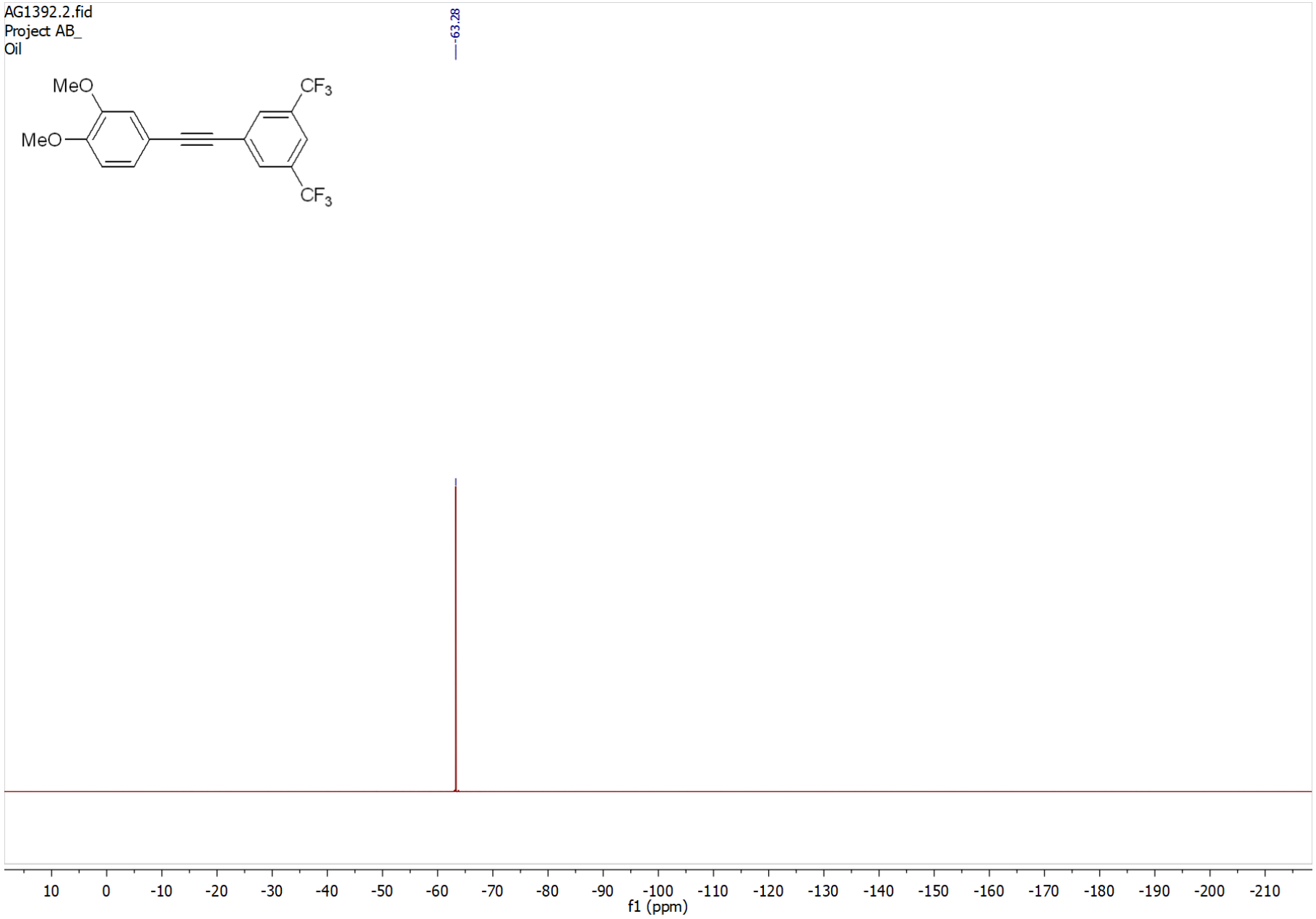
Compound 9d


AG1279.5.fid
Project AB_
Oil
160.63
133.59
132.56
132.23
131.89
131.56
131.44
131.40
131.36
131.32
127.31
126.26
124.60
121.89
121.34
121.30
121.27
121.23
121.19
119.18
114.40
114.11
93.29
85.49
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.44
MeO
CF3
CF3
f1 (ppm)

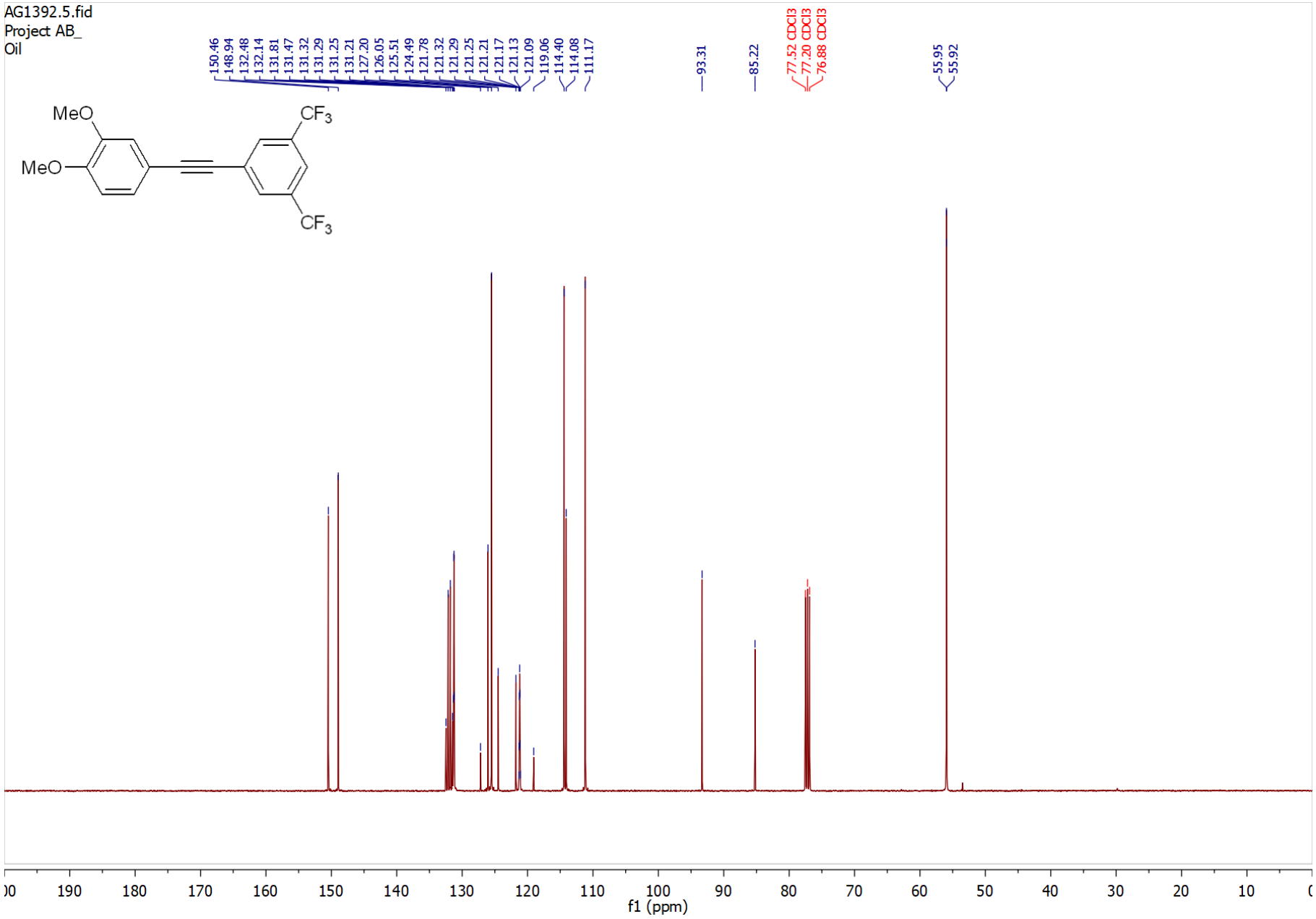
Compound 9e


AG1392.3.fid
Project AB_
Oil
7.90
7.76
7.26 CDCl3
7.16
7.15
7.14
7.13
7.04
7.03
6.84
6.82
3.89
3.88
MeO
MeO
CF3
CF3
2.02
1.00
1.01
1.01
1.01
6.06
f1 (ppm)

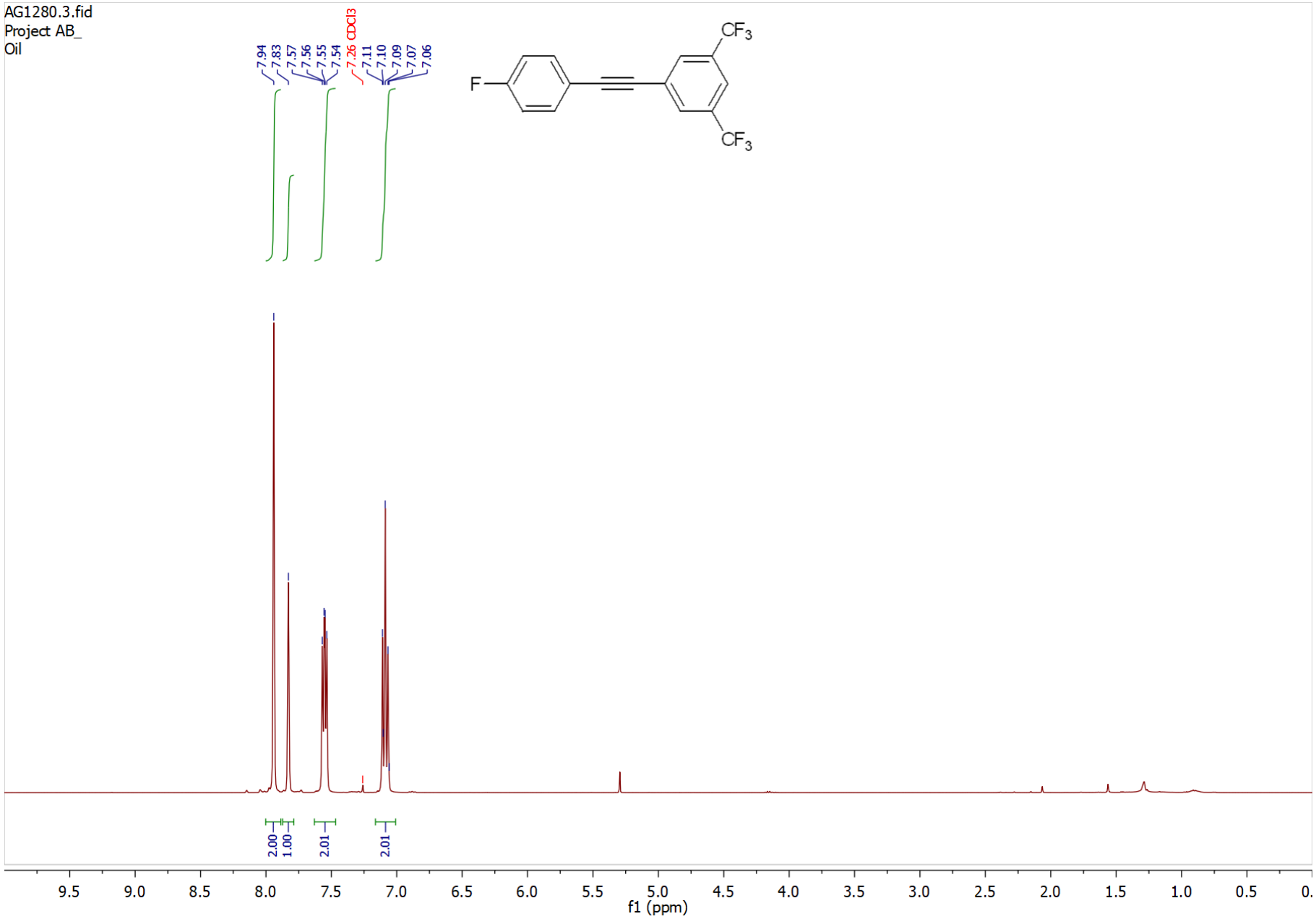
Compound 9e


AG1392.2.fid
Project AB_
Oil
63.28
MeO
MeO
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

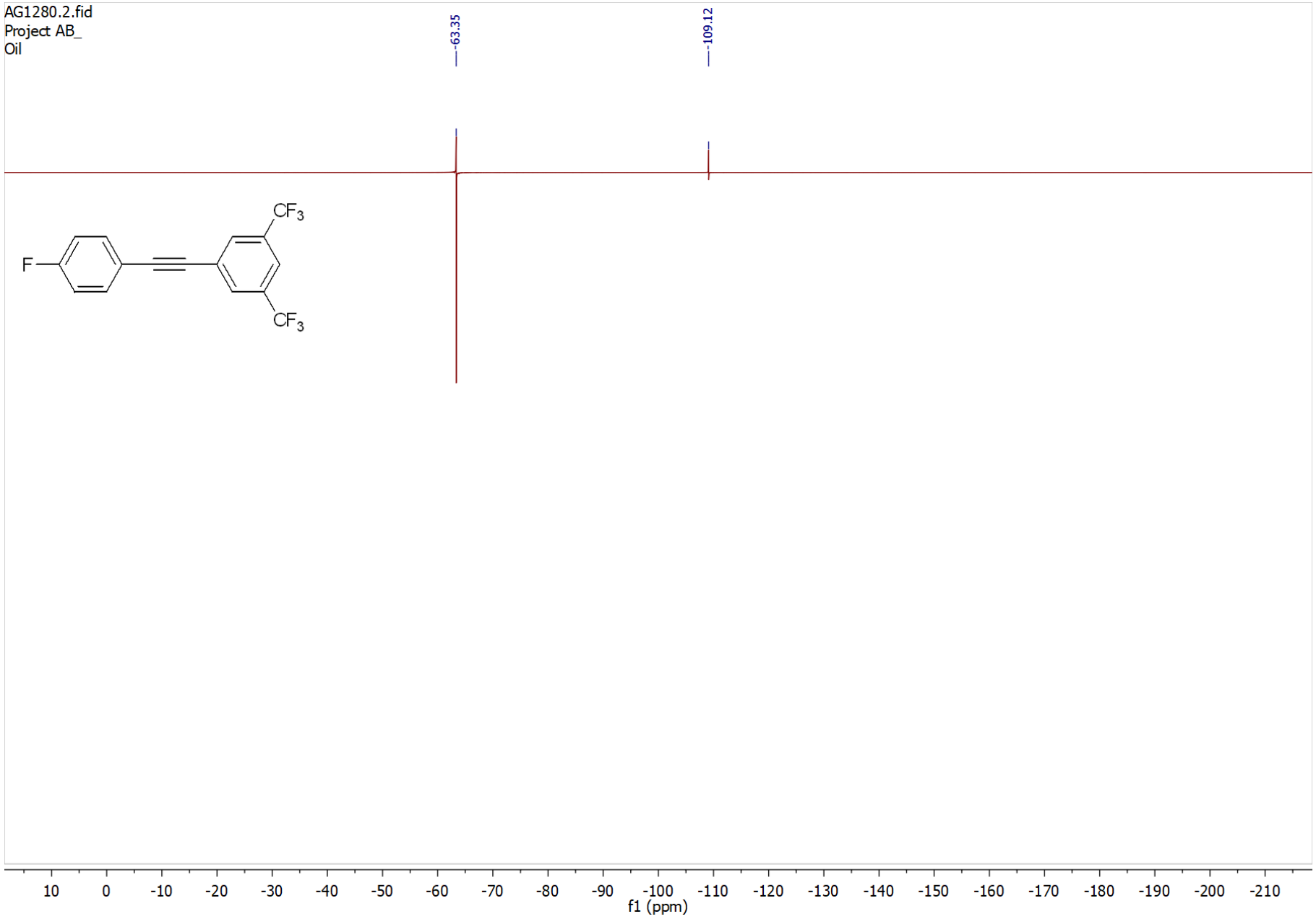
Compound 9e


AG1392.5.fid
Project AB_
Oil
150.46
148.94
132.48
132.14
131.81
131.47
131.32
131.29
131.25
131.21
127.20
126.05
125.51
124.49
121.78
121.32
121.29
121.25
121.21
121.17
121.13
121.09
119.06
114.40
114.08
111.17
93.31
85.22
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.95
55.92
MeO
MeO
CF3
CF3
f1 (ppm)

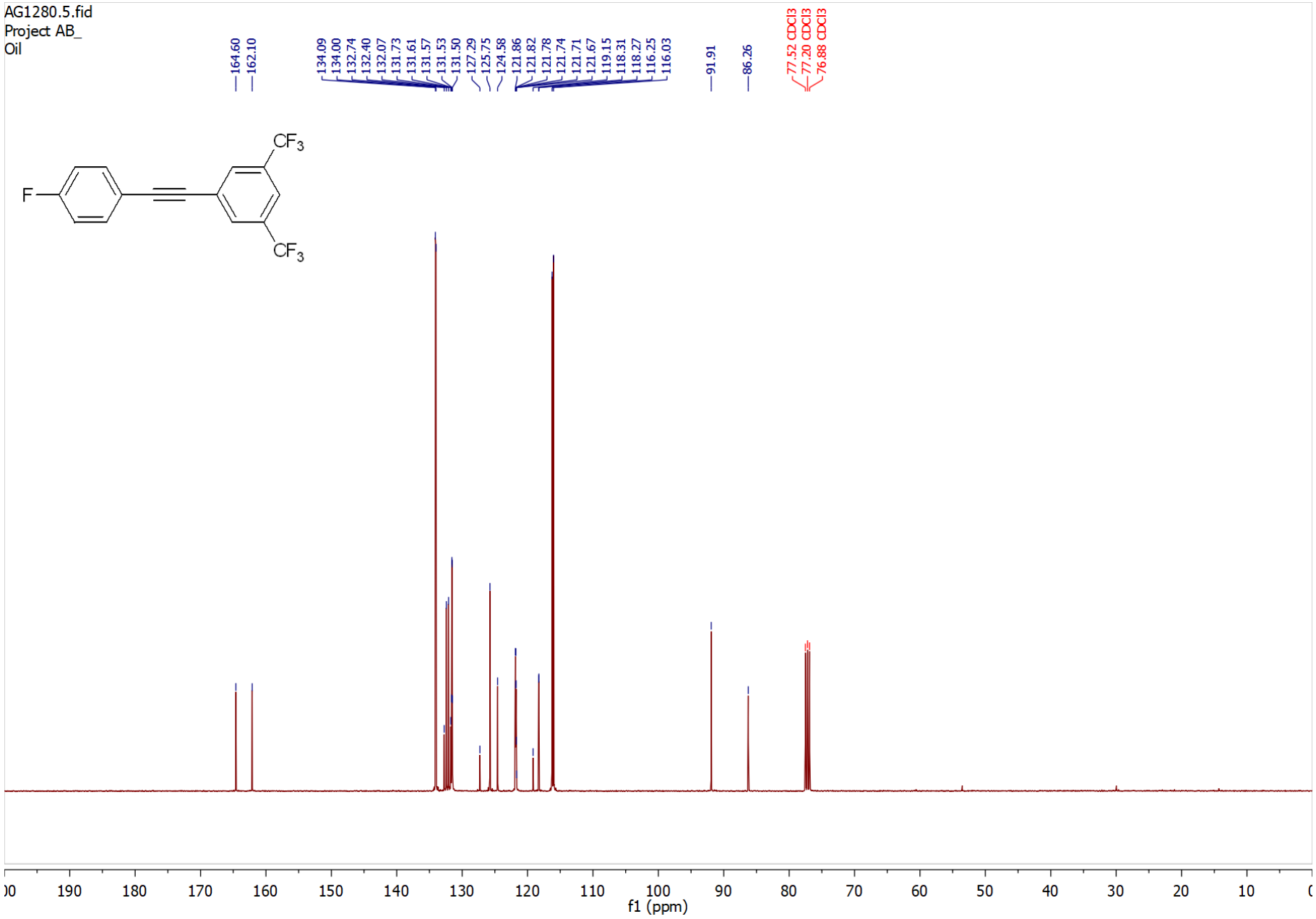
Compound 9f


AG1280.3.fid
Project AB_
Oil
7.94
7.83
7.57
7.56
7.55
7.54
7.26 CDCl3
7.11
7.10
7.09
7.07
7.06
F
CF3
CF3
2.00
1.00
2.01
2.01
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

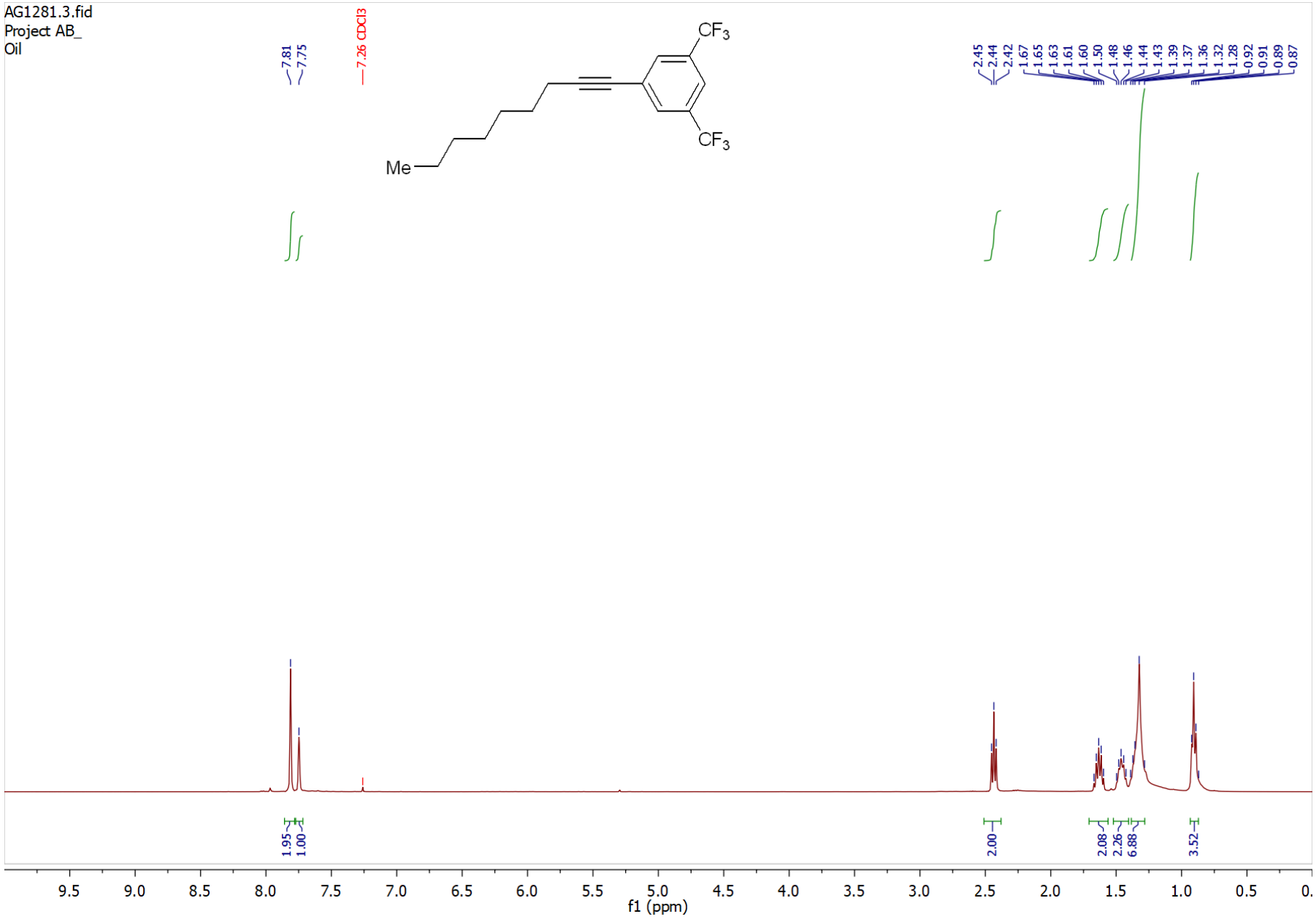
Compound 9f


AG1280.2.fid
Project AB_
Oil
-63.35
-109.12
F
CF3
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

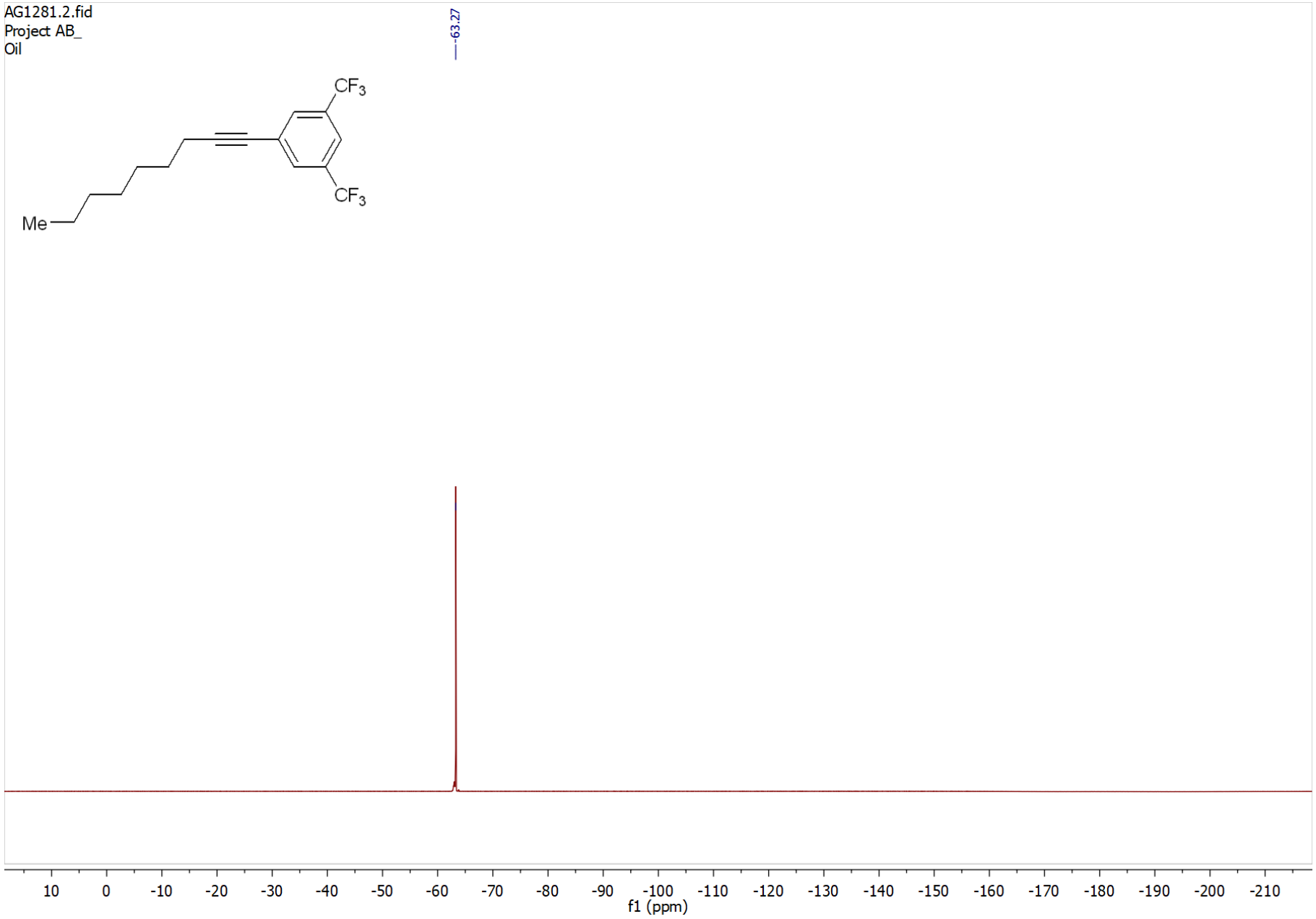
Compound 9f


AG1280.5.fid
Project AB_
Oil
164.60
162.10
134.09
134.00
132.74
132.40
132.07
131.73
131.61
131.57
131.53
131.50
127.29
125.75
124.58
121.86
121.82
121.78
121.74
121.71
121.67
119.15
118.31
118.27
116.25
116.03
91.91
86.26
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
F
CF3
CF3
f1 (ppm)

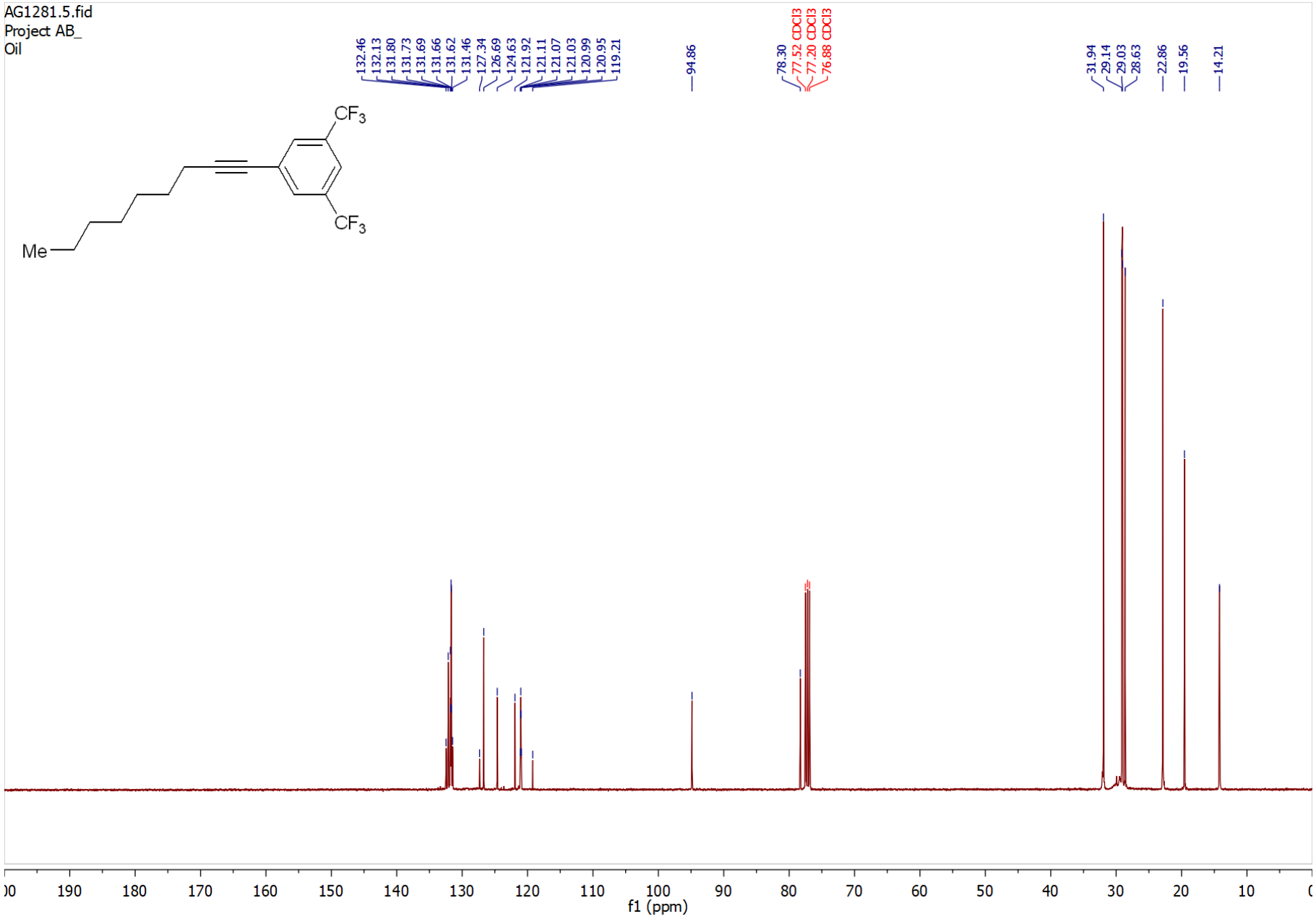
Compound 9g


AG1281.3.fid
Project AB_
Oil
7.81
7.75
7.26 CDCl3
CF3
CF3
Me
2.45
2.44
2.42
1.67
1.65
1.63
1.61
1.60
1.50
1.48
1.46
1.44
1.43
1.39
1.37
1.36
1.32
1.28
0.92
0.91
0.89
0.87
1.95
1.00
2.00
2.08
2.26
6.88
3.52
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

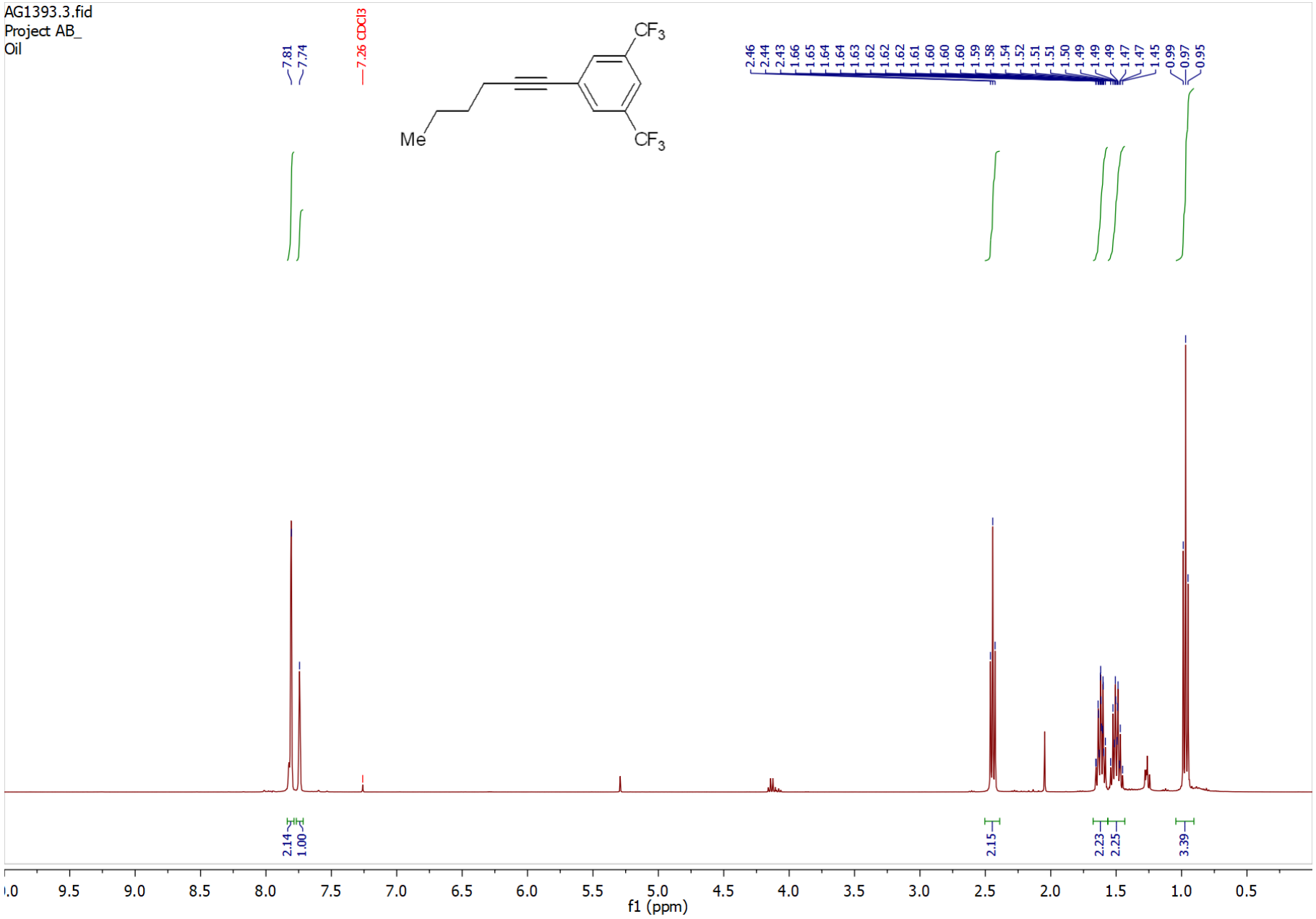
Compound 9g


AG1281.2.fid
Project AB_
Oil
63.27
CF3
CF3
Me
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

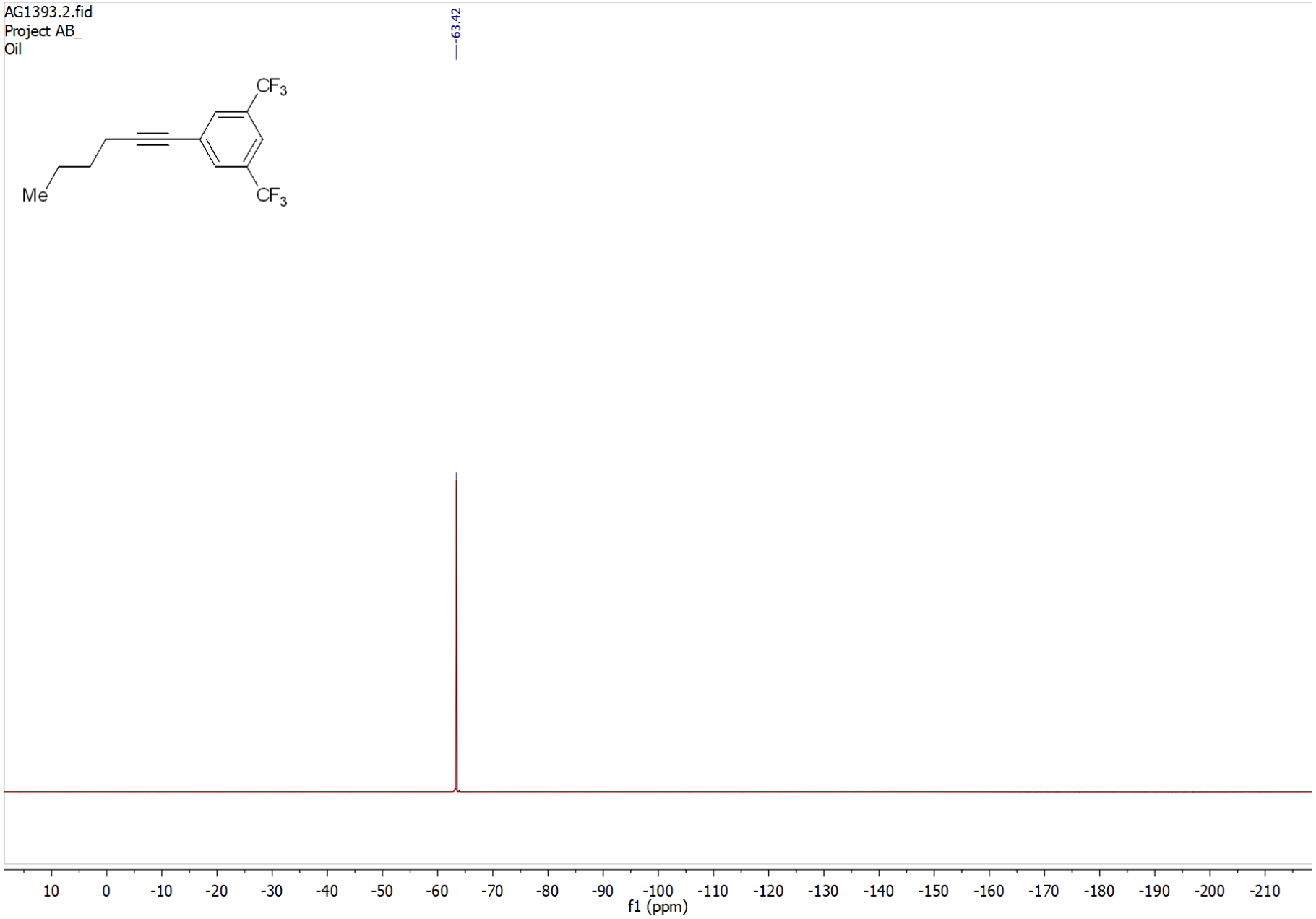
Compound 9g


AG1281.5.fid
Project AB_
Oil
132.46
132.13
131.80
131.73
131.69
131.66
131.62
131.46
127.34
126.69
124.63
121.92
121.11
121.07
121.03
120.99
120.95
119.21
94.86
78.30
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
31.94
29.14
29.03
28.63
22.86
19.56
14.21
CF3
CF3
Me
f1 (ppm)

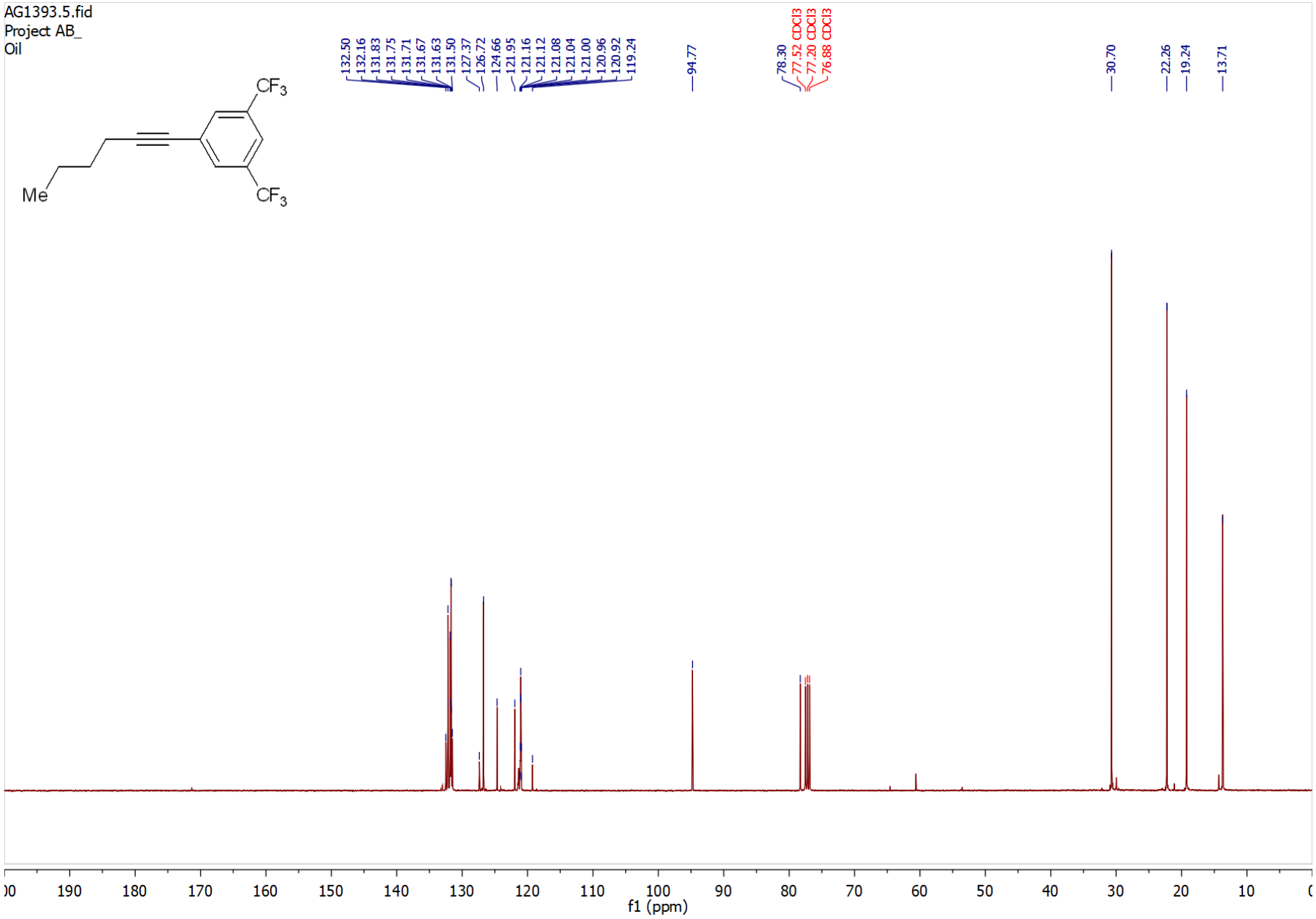
Compound 9h


AG1393.3.fid
Project AB_
Oil
7.81
7.74
7.26 CDCl3
CF3
Me
CF3
2.46
2.44
2.43
1.66
1.65
1.64
1.64
1.63
1.62
1.62
1.62
1.61
1.60
1.60
1.60
1.59
1.58
1.54
1.52
1.51
1.51
1.50
1.49
1.49
1.49
1.47
1.47
1.45
0.99
0.97
0.95
2.14
1.00
2.15
2.23
2.25
3.39
f1 (ppm)

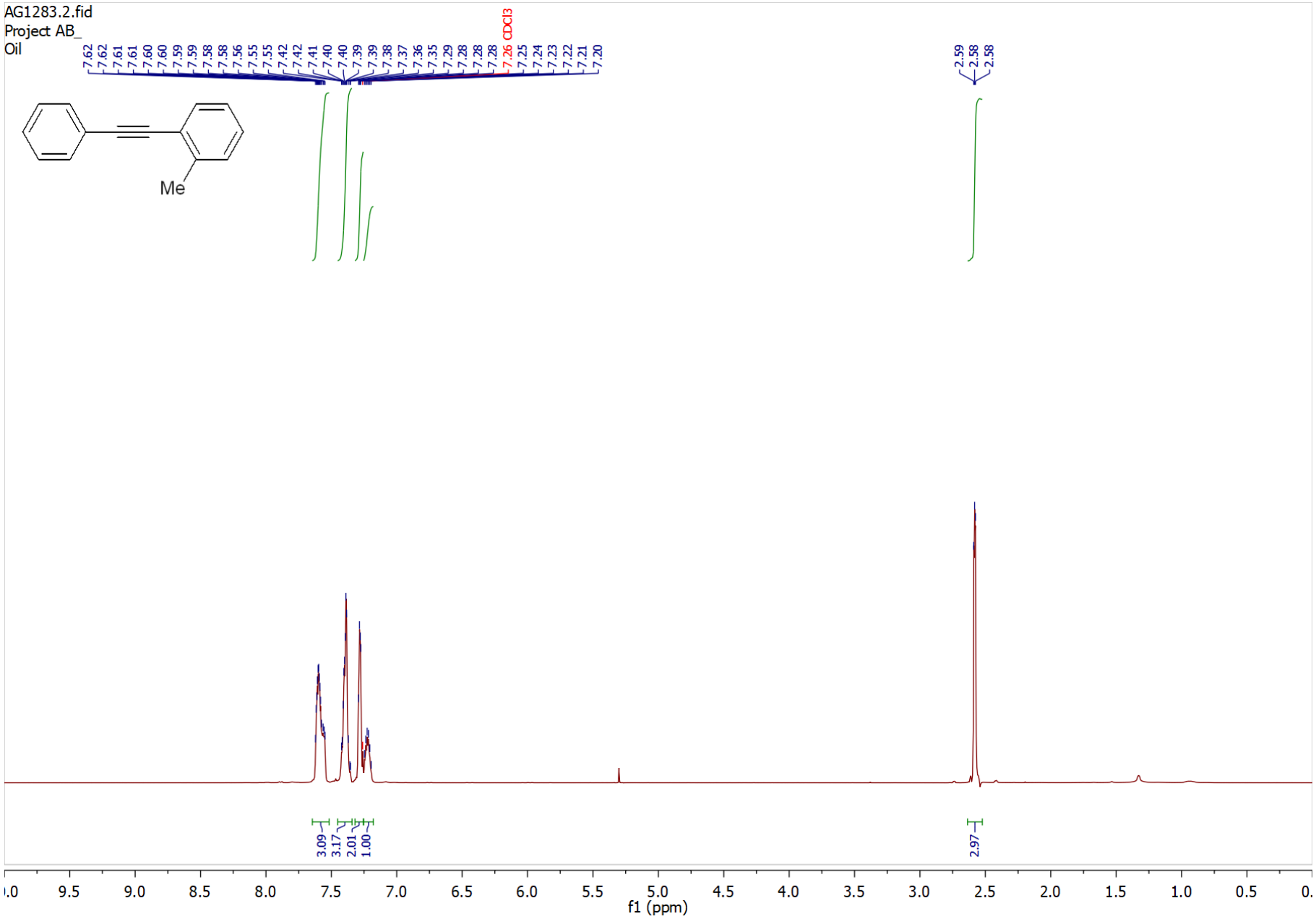
Compound 9h


AG1393.2.fid
Project AB_
Oil
-63.42
CF3
CF3
Me
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

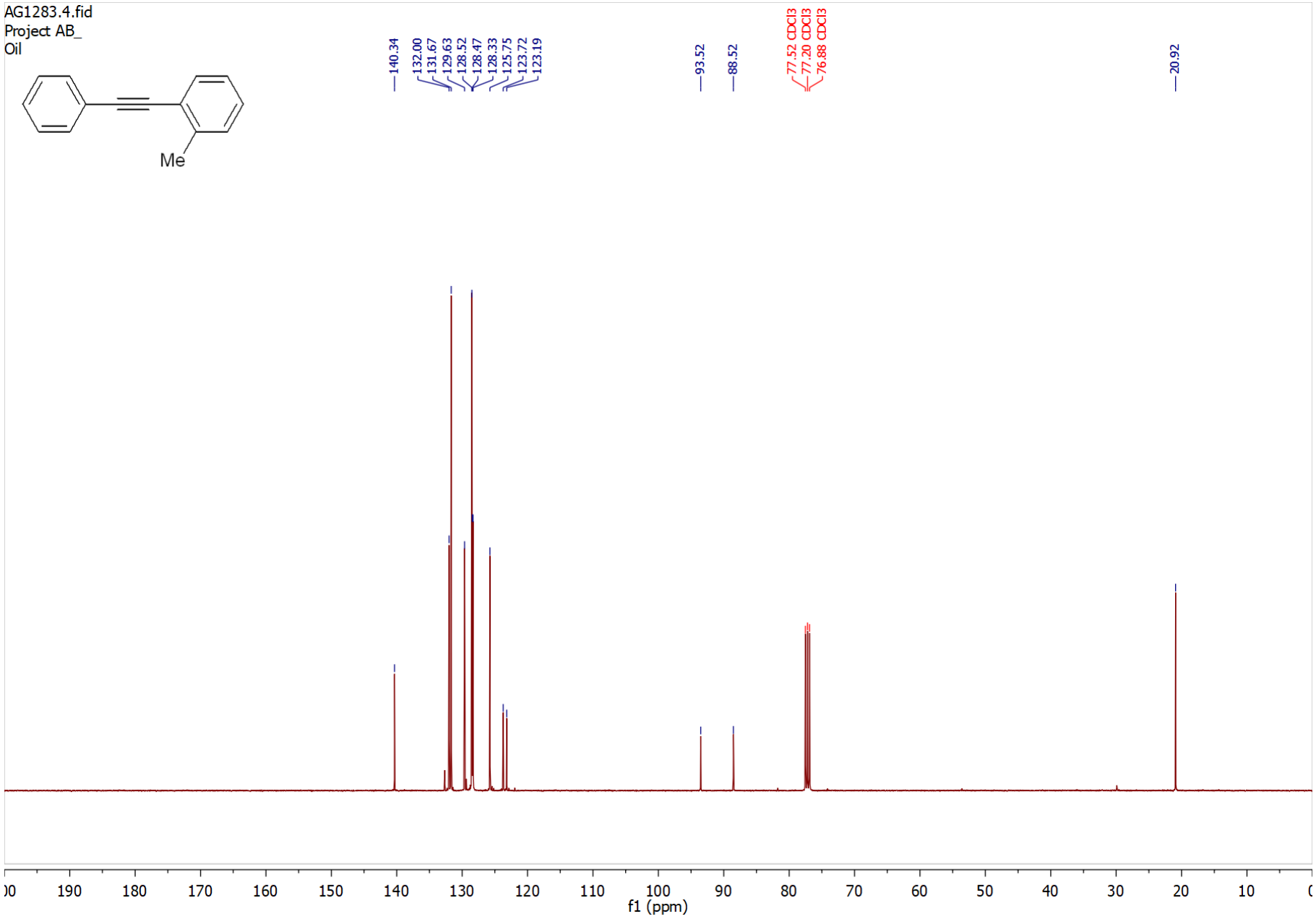
Compound 9h


AG1393.5.fid
Project AB_
Oil
CF3
CF3
Me
132.50
132.16
131.83
131.75
131.71
131.67
131.63
131.50
127.37
126.72
124.66
121.95
121.16
121.12
121.08
121.04
121.00
120.96
120.92
119.24
94.77
78.30
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
30.70
22.26
19.24
13.71
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

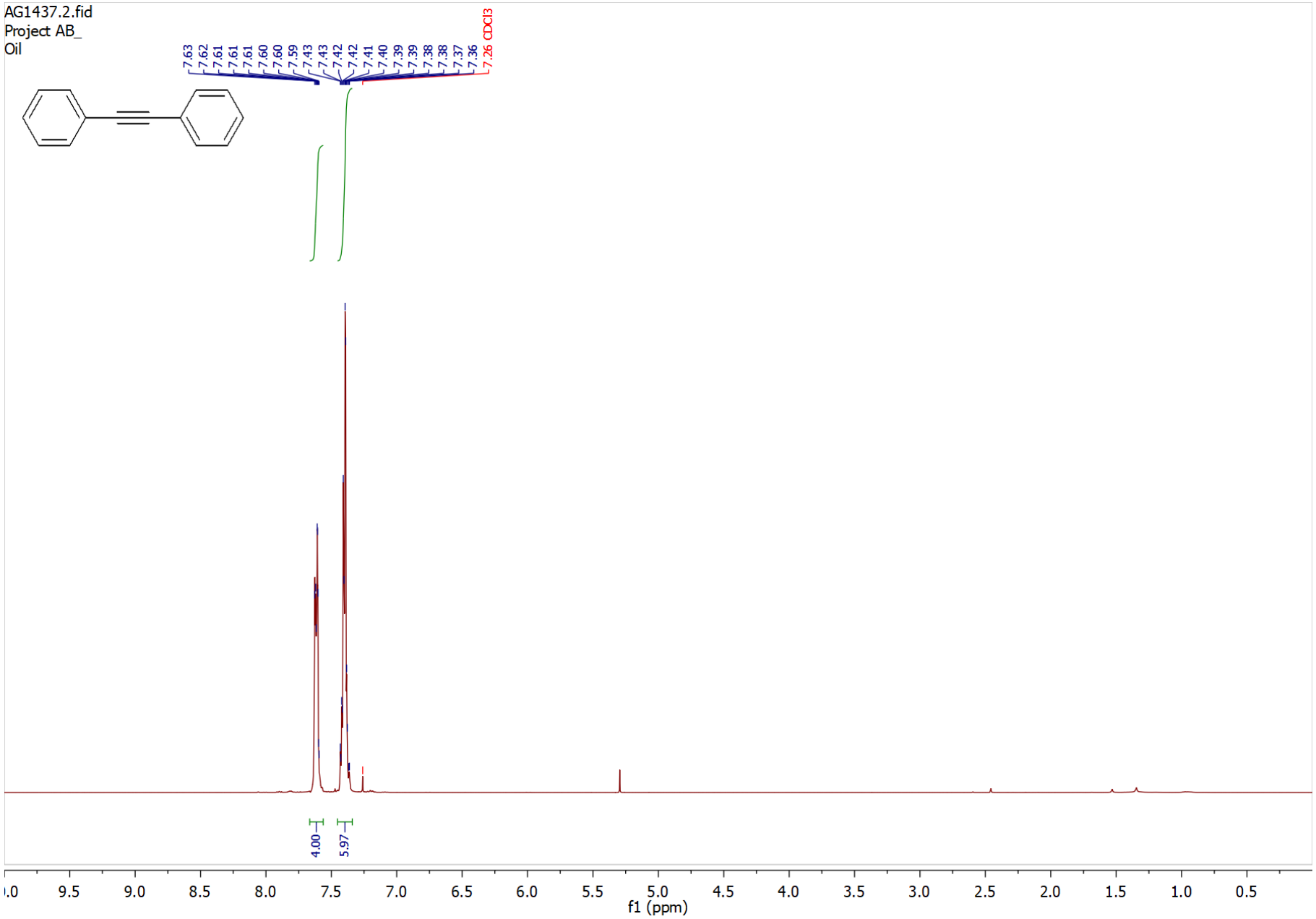
Compound 9i


AG1283.2.fid
Project AB_
Oil
7.62 7.62 7.61 7.61 7.60 7.60 7.59 7.59 7.58 7.58 7.56 7.55 7.55 7.42 7.42 7.41 7.40 7.40 7.39 7.39 7.38 7.37 7.36 7.35 7.29 7.28 7.28 7.28 CDCl3 7.25 7.24 7.23 7.22 7.21 7.20
2.59 2.58 2.58
Me
3.09
3.17
2.01
1.00
2.97
f1 (ppm)

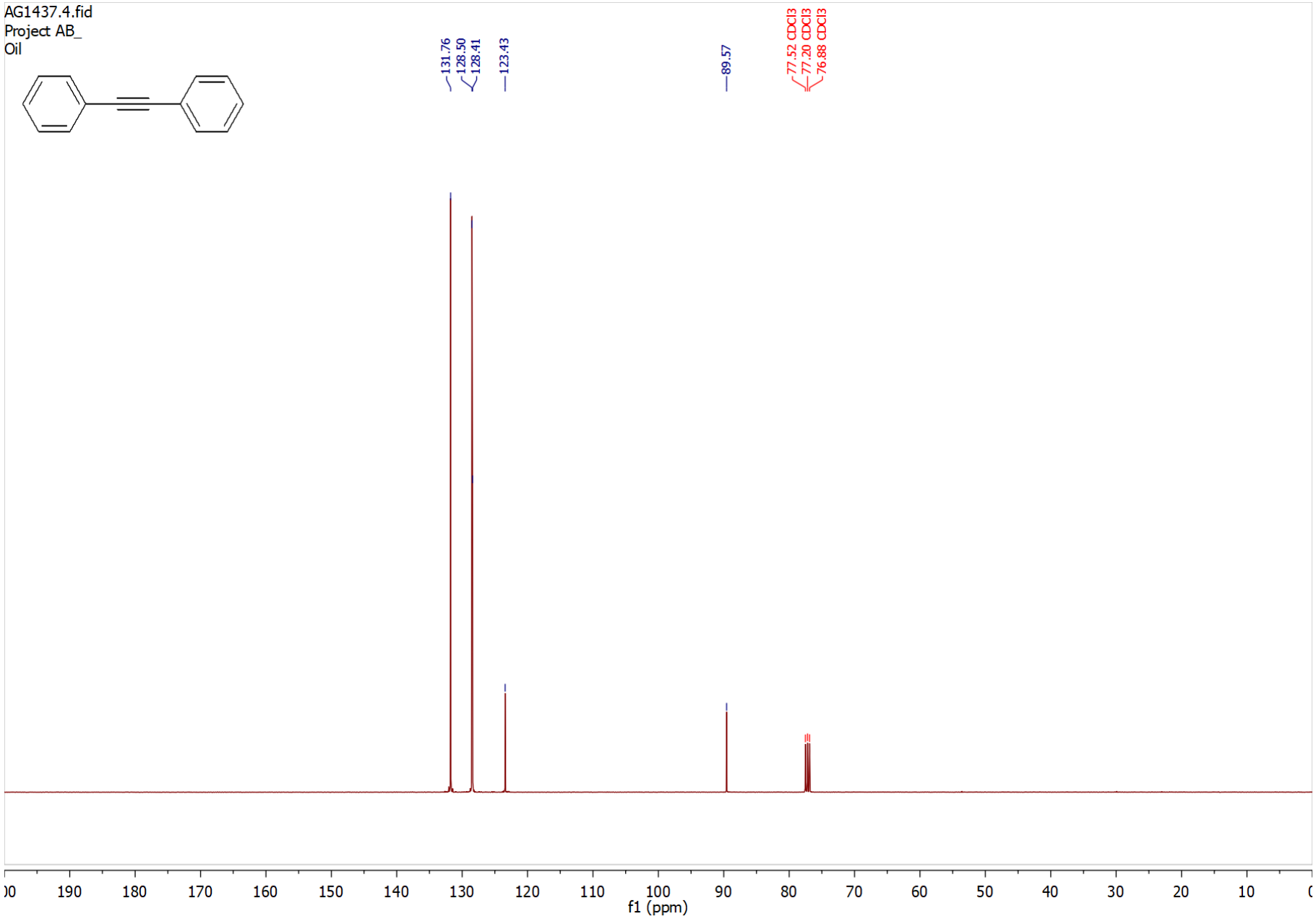
Compound 9i


AG1283.4.fid
Project AB_
Oil
Me
140.34
132.00
131.67
129.63
128.52
128.47
128.33
125.75
123.72
123.19
93.52
88.52
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
20.92
f1 (ppm)

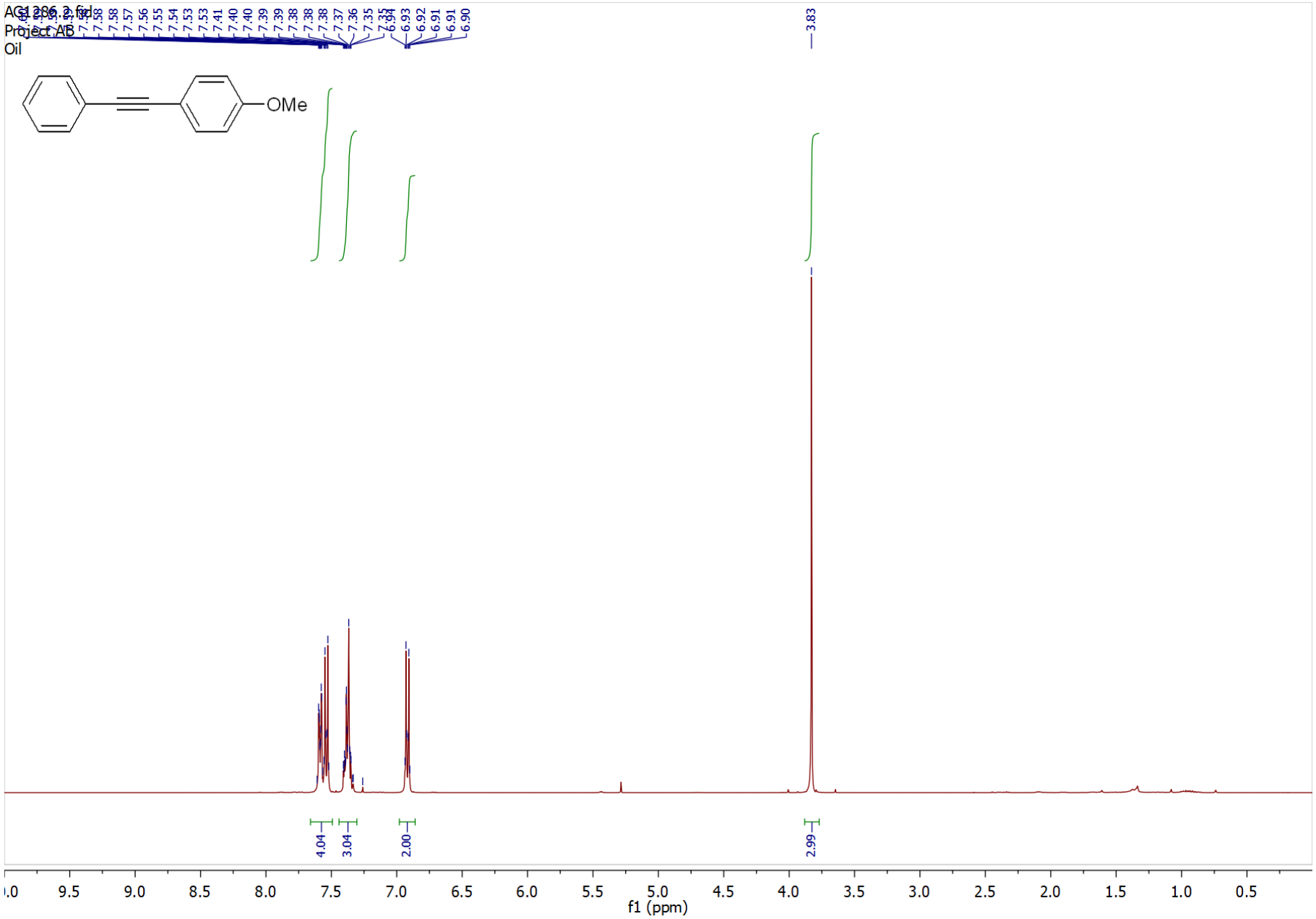
Compound 9j


AG1437.2.fid
Project AB_
Oil
7.63
7.62
7.61
7.61
7.61
7.60
7.60
7.59
7.43
7.43
7.42
7.42
7.41
7.40
7.39
7.39
7.38
7.38
7.37
7.36
7.26 CDCl3
4.00
5.97
f1 (ppm)

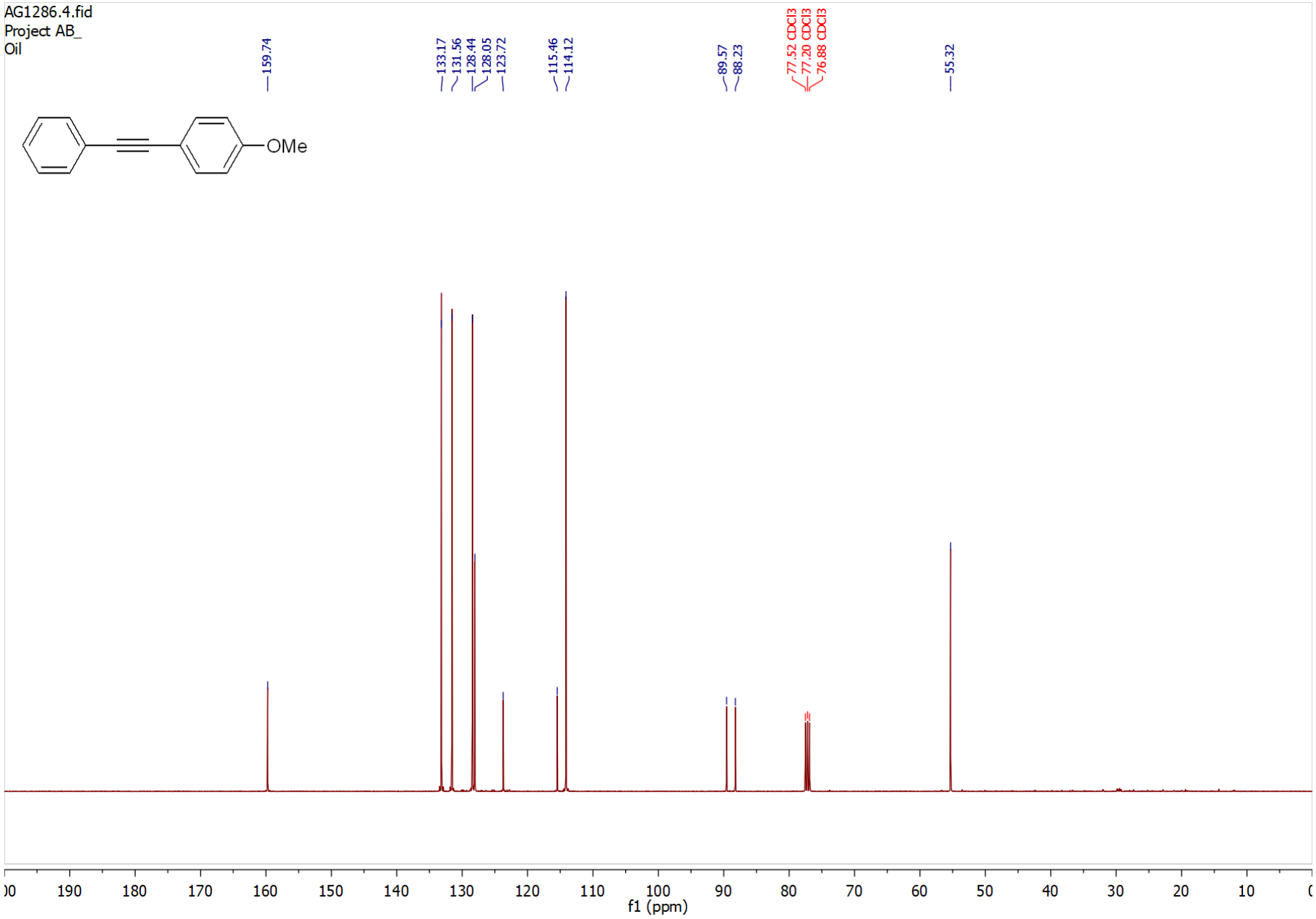
Compound 9j


AG1437.4.fid
Project AB_
Oil
131.76
128.50
128.41
123.43
89.57
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
f1 (ppm)

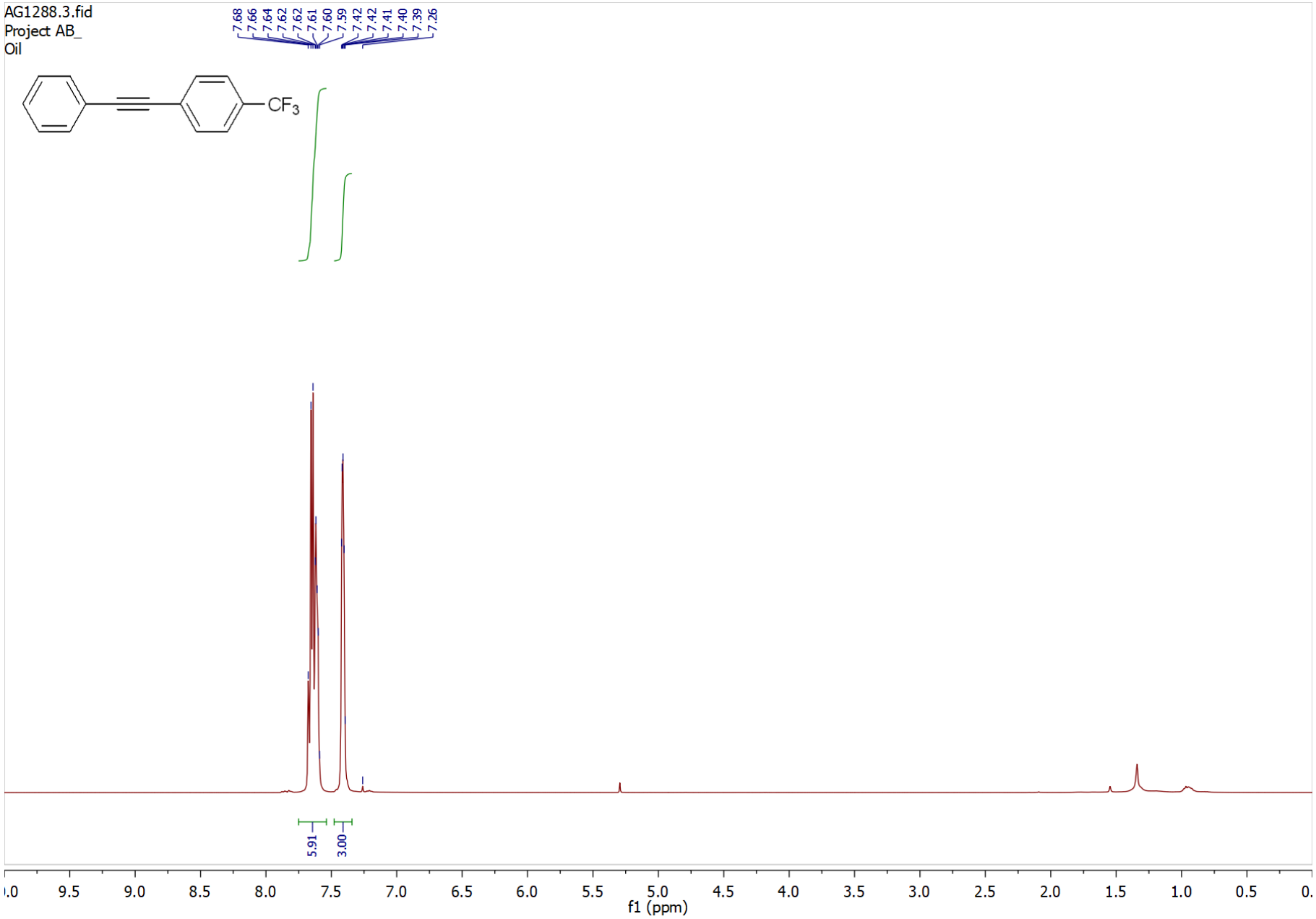
Compound 9k


AG1386_2.fid
Project AB
Oil
OMe
7.58
7.58
7.57
7.56
7.55
7.54
7.53
7.53
7.41
7.40
7.40
7.39
7.39
7.38
7.38
7.38
7.37
7.36
7.35
6.93
6.92
6.91
6.91
6.90
3.83
4.04
3.04
2.00
2.99
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
f1 (ppm)

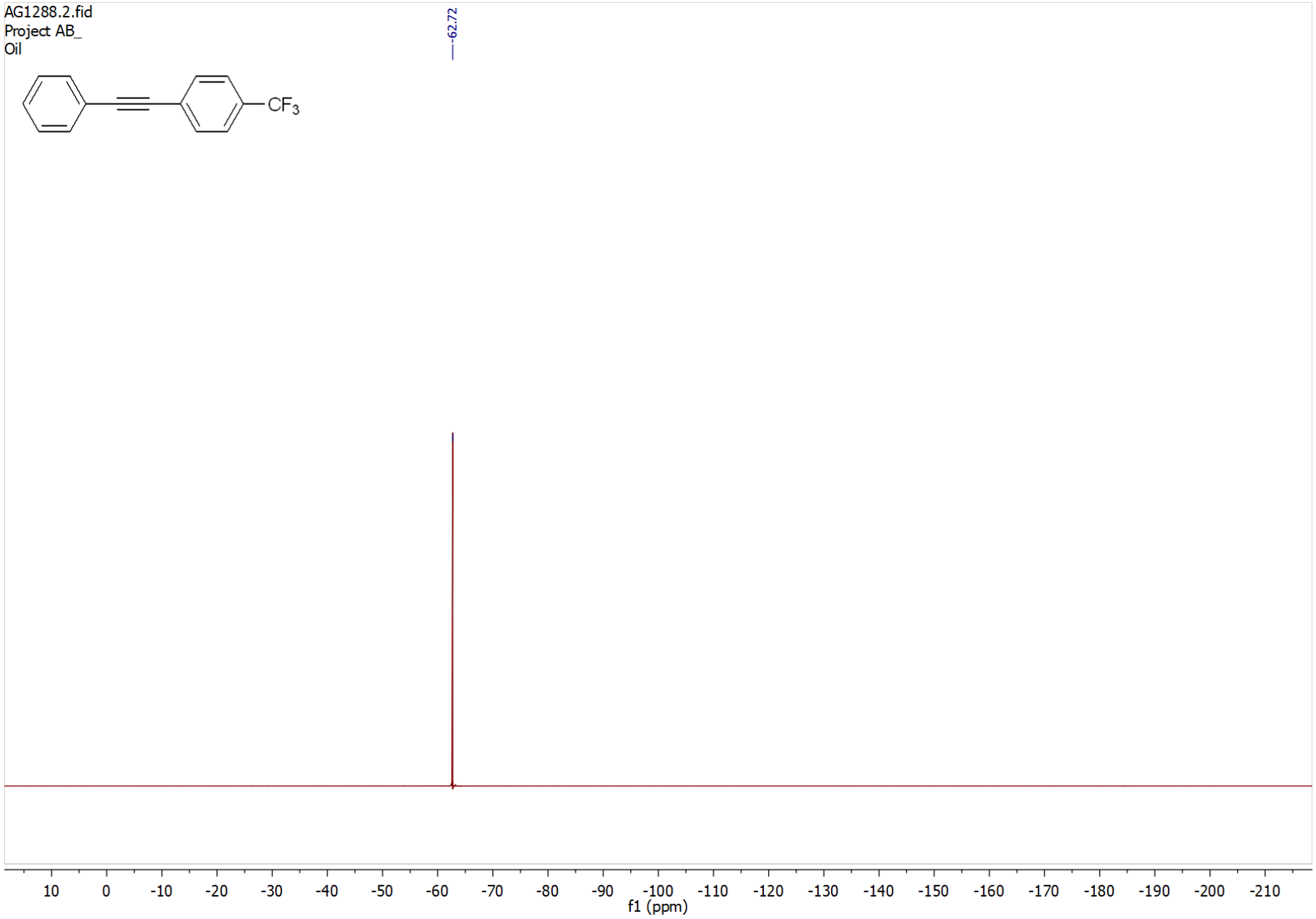
Compound 9k


AG1286.4.fid
Project AB_
Oil
159.74
133.17
131.56
128.44
128.05
123.72
115.46
114.12
89.57
88.23
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
55.32
OMe
f1 (ppm)

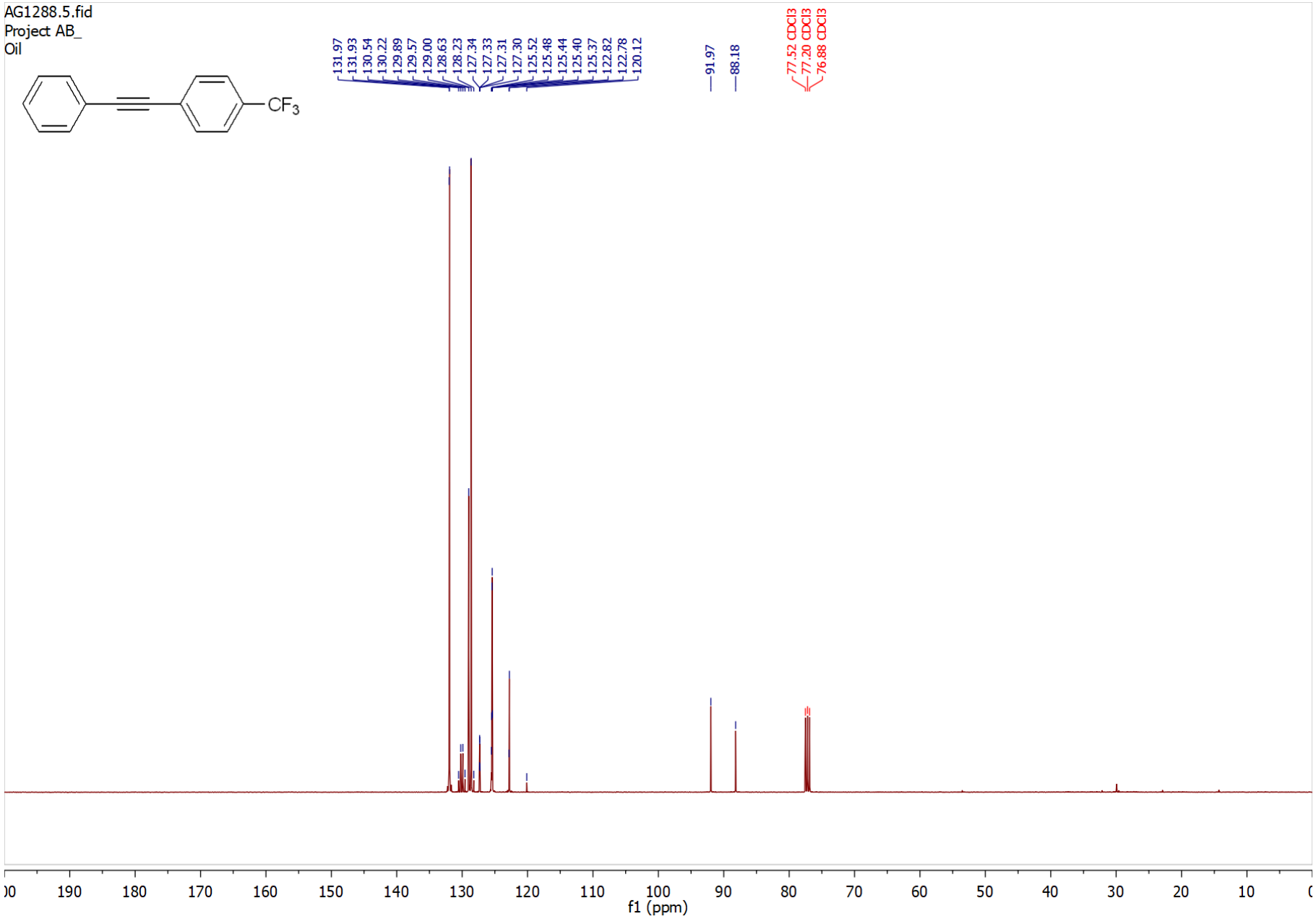
Compound 9l


AG1288.3.fid
Project AB_
Oil
7.68
7.66
7.64
7.62
7.62
7.61
7.60
7.59
7.42
7.42
7.41
7.40
7.39
7.26
CF3
5.91
3.00
f1 (ppm)

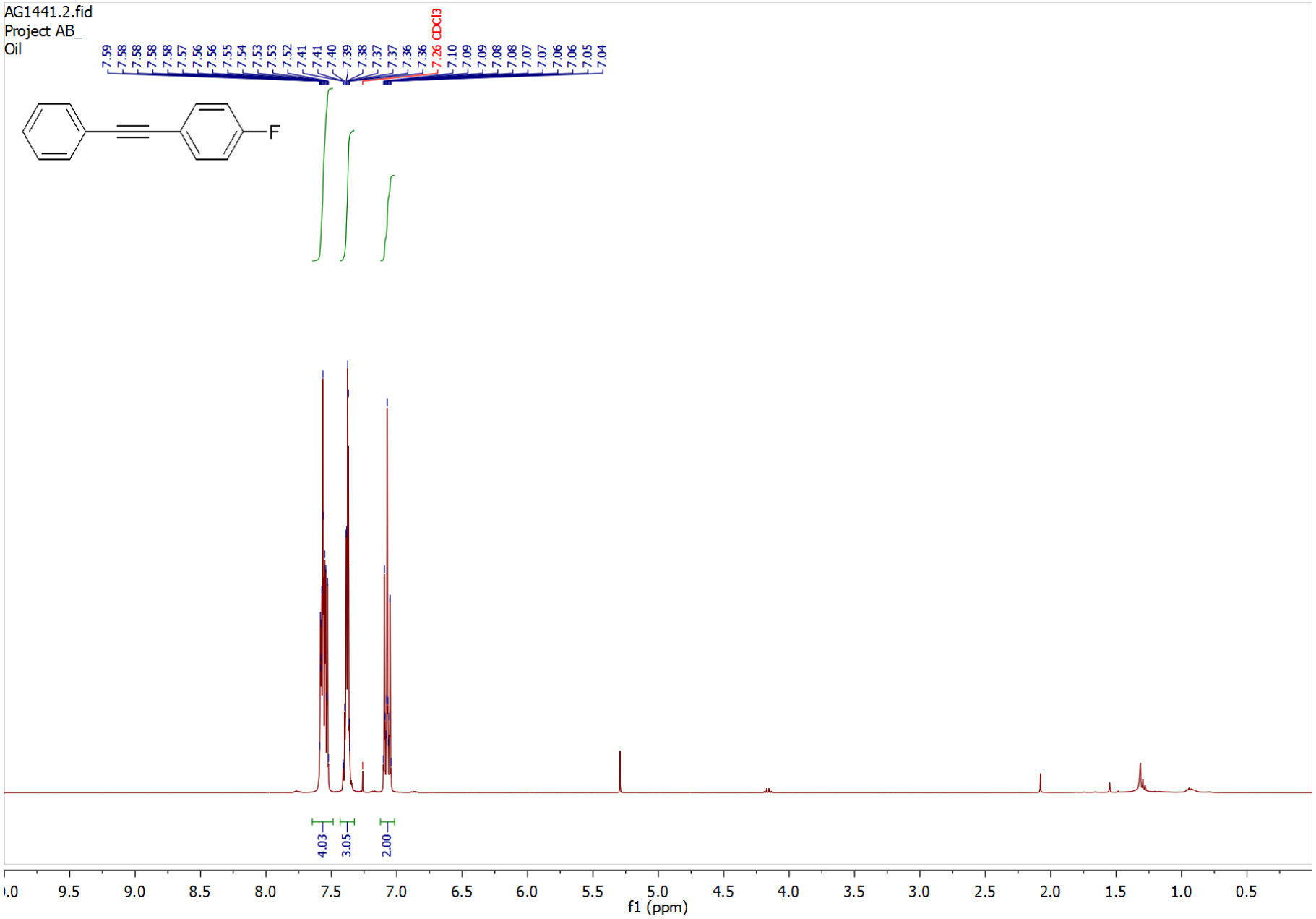
Compound 9l


AG1288.2.fid
Project AB_
Oil
62.72
CF3
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

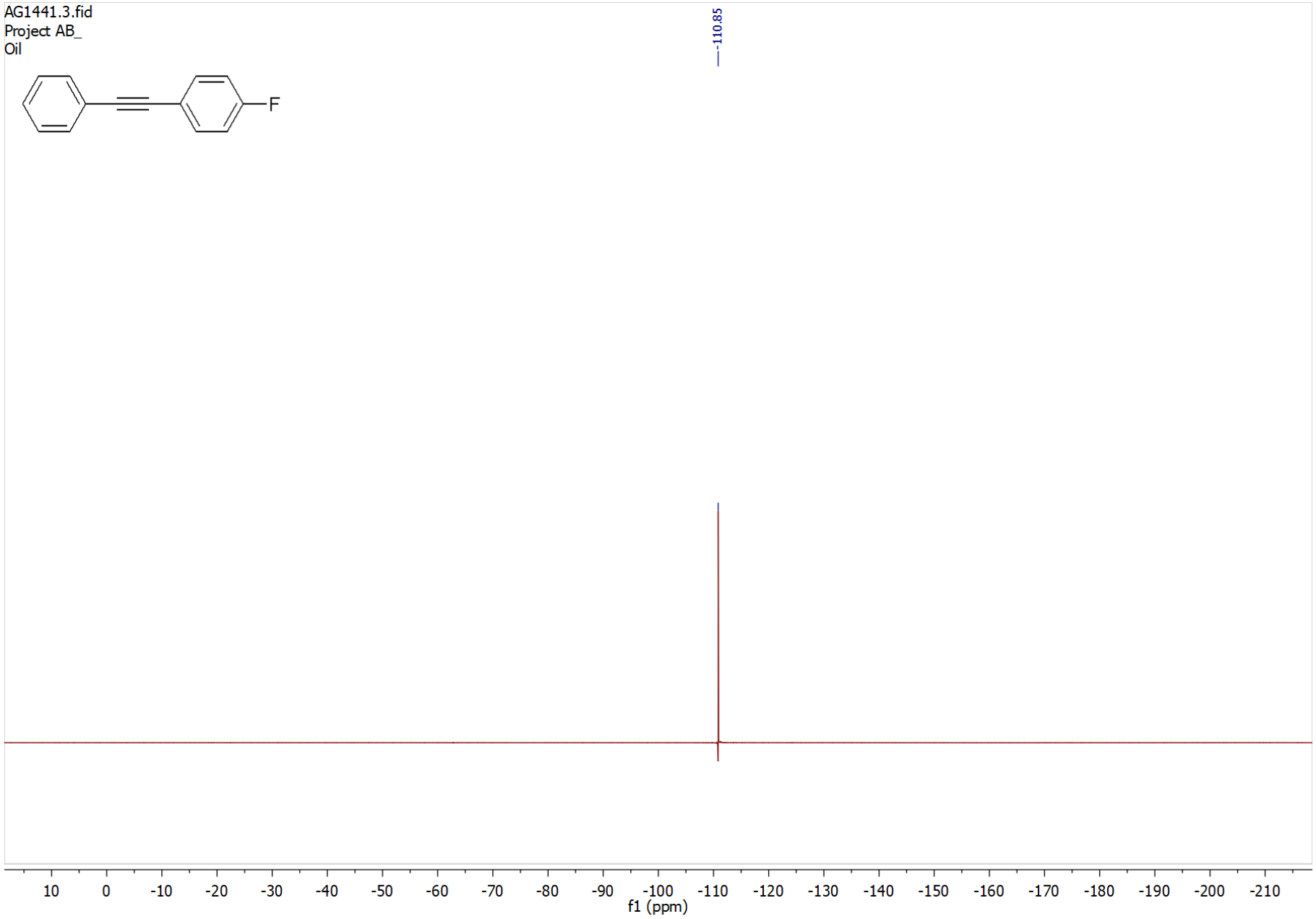
Compound 9l


AG1288.5.fid
Project AB_
Oil
CF3
131.97
131.93
130.54
130.22
129.89
129.57
129.00
128.63
128.23
127.34
127.33
127.31
127.30
125.52
125.48
125.44
125.40
125.37
122.82
122.78
120.12
91.97
88.18
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

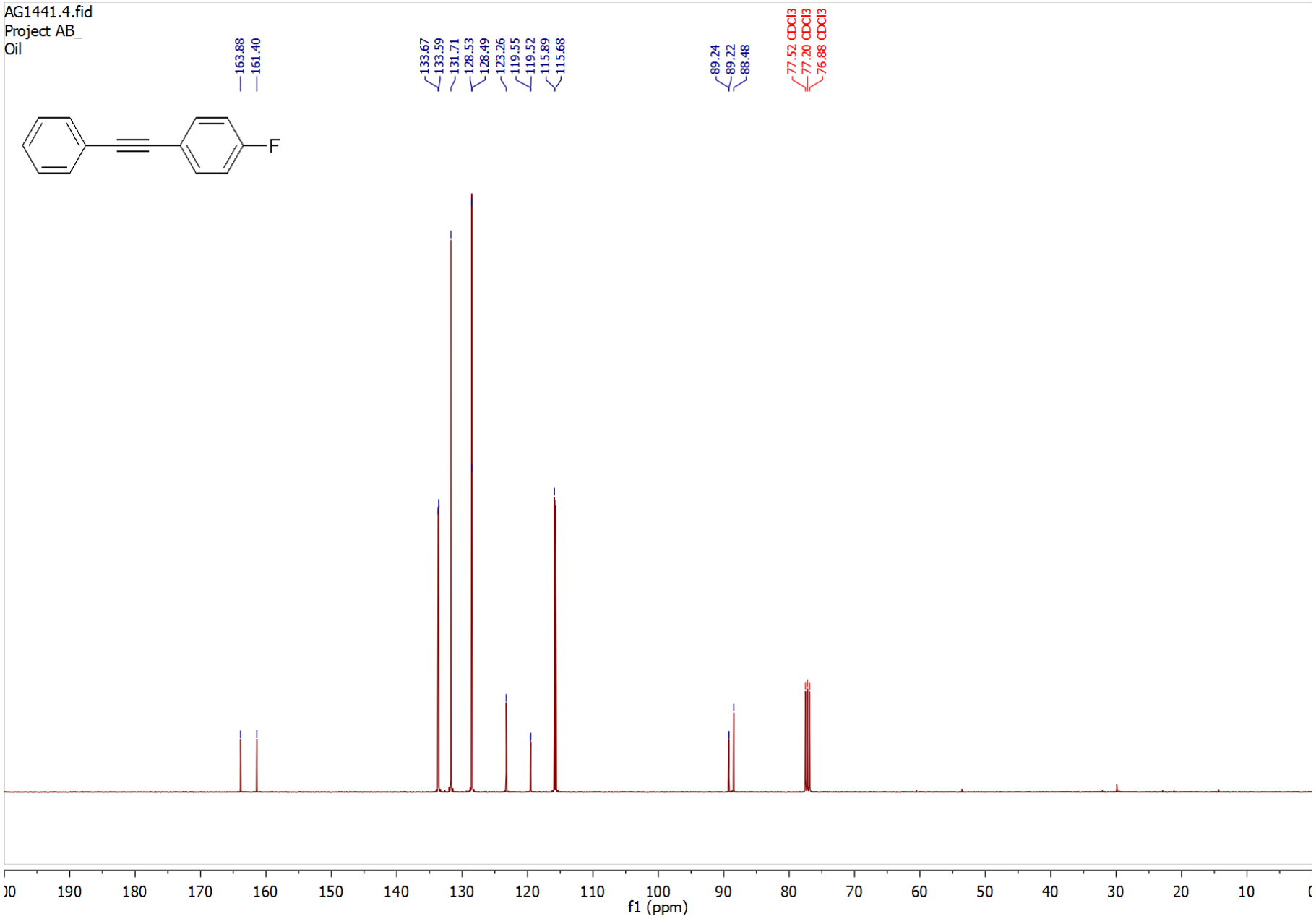
Compound 9m


AG1441.2.fid
Project AB_
Oil
7.59 7.58 7.58 7.58 7.58 7.57 7.56 7.56 7.55 7.54 7.53 7.53 7.52 7.41 7.41 7.40 7.39 7.38 7.37 7.37 7.36 7.36 CDCl3 7.26 7.10 7.09 7.09 7.08 7.08 7.07 7.07 7.06 7.06 7.05 7.04
F
4.03
3.05
2.00
9.5 9.0 8.5 8.0 7.5 7.0 6.5 6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
f1 (ppm)

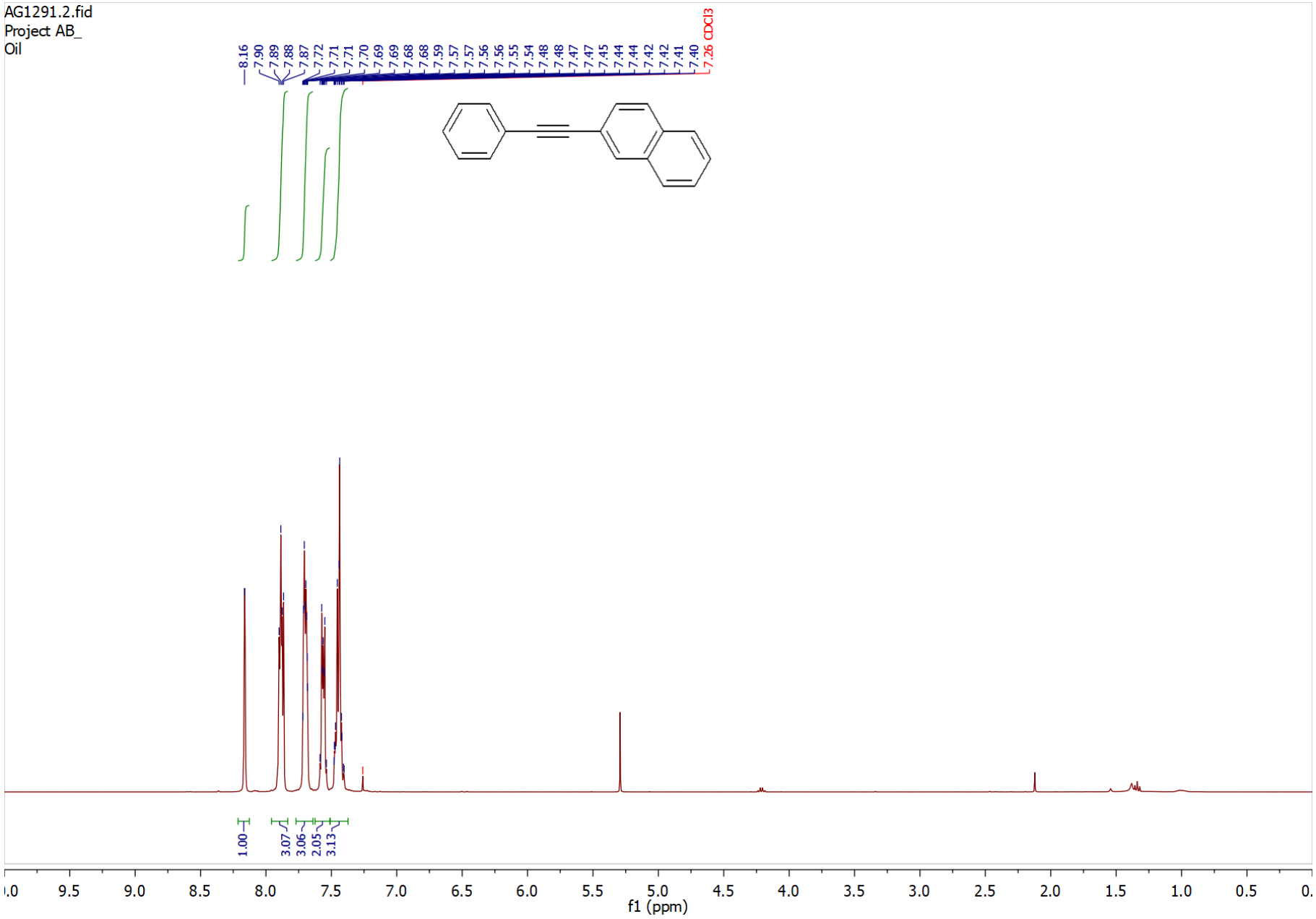
Compound 9m


AG1441.3.fid
Project AB_
Oil
F
-110.85
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
-130
-140
-150
-160
-170
-180
-190
-200
-210
f1 (ppm)

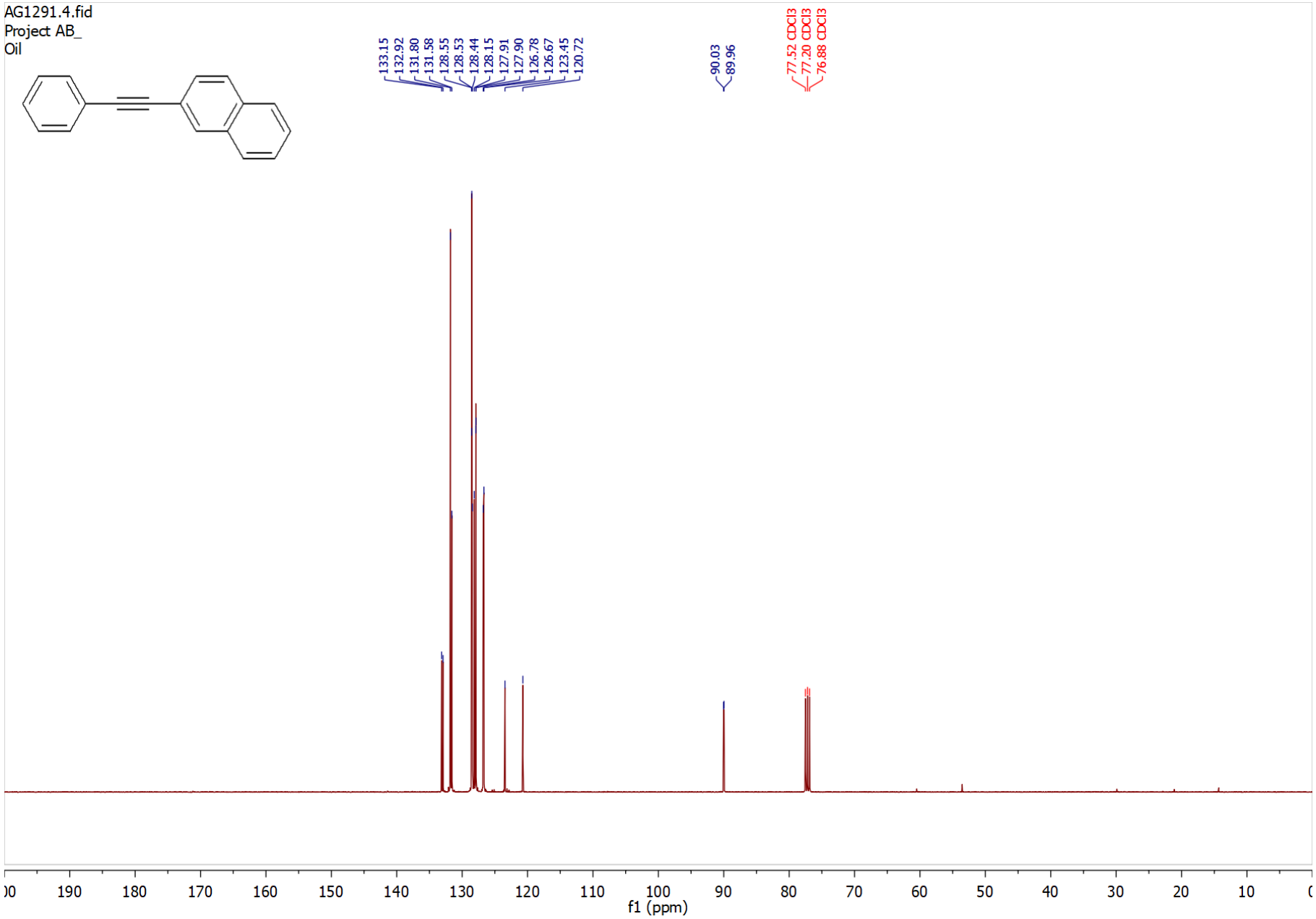
Compound 9m


AG1441.4.fid
Project AB_
Oil
163.88
161.40
133.67
133.59
131.71
128.53
128.49
123.26
119.55
119.52
115.89
115.68
89.24
89.22
88.48
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
F
f1 (ppm)

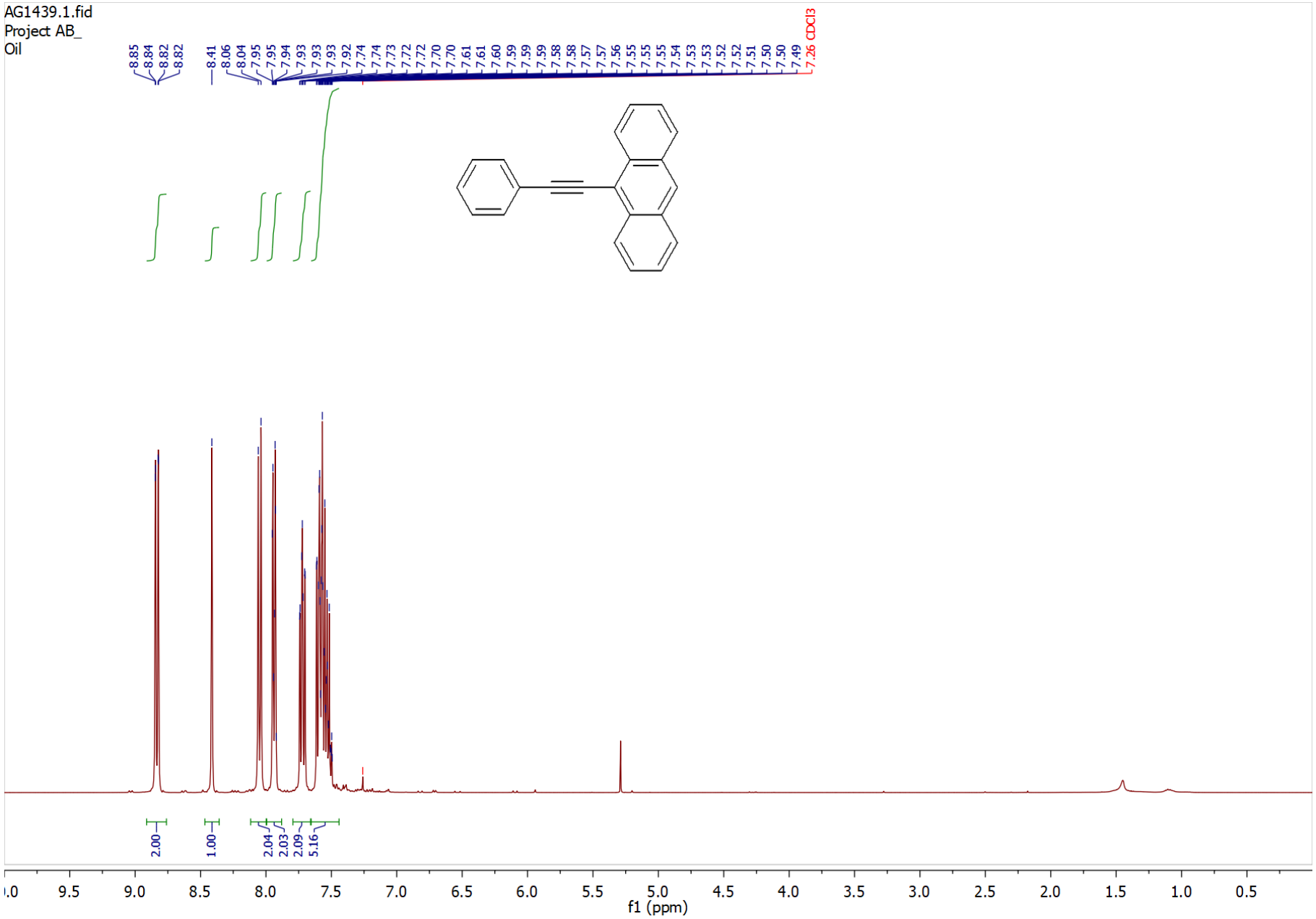
Compound 9n


AG1291.2.fid
Project AB_
Oil
8.16
7.90
7.89
7.88
7.87
7.72
7.71
7.71
7.70
7.69
7.69
7.68
7.68
7.59
7.57
7.57
7.56
7.56
7.55
7.54
7.48
7.48
7.47
7.47
7.45
7.44
7.44
7.42
7.42
7.41
7.40
7.26 CDCl3
1.00
3.07
3.06
2.05
3.13
f1 (ppm)

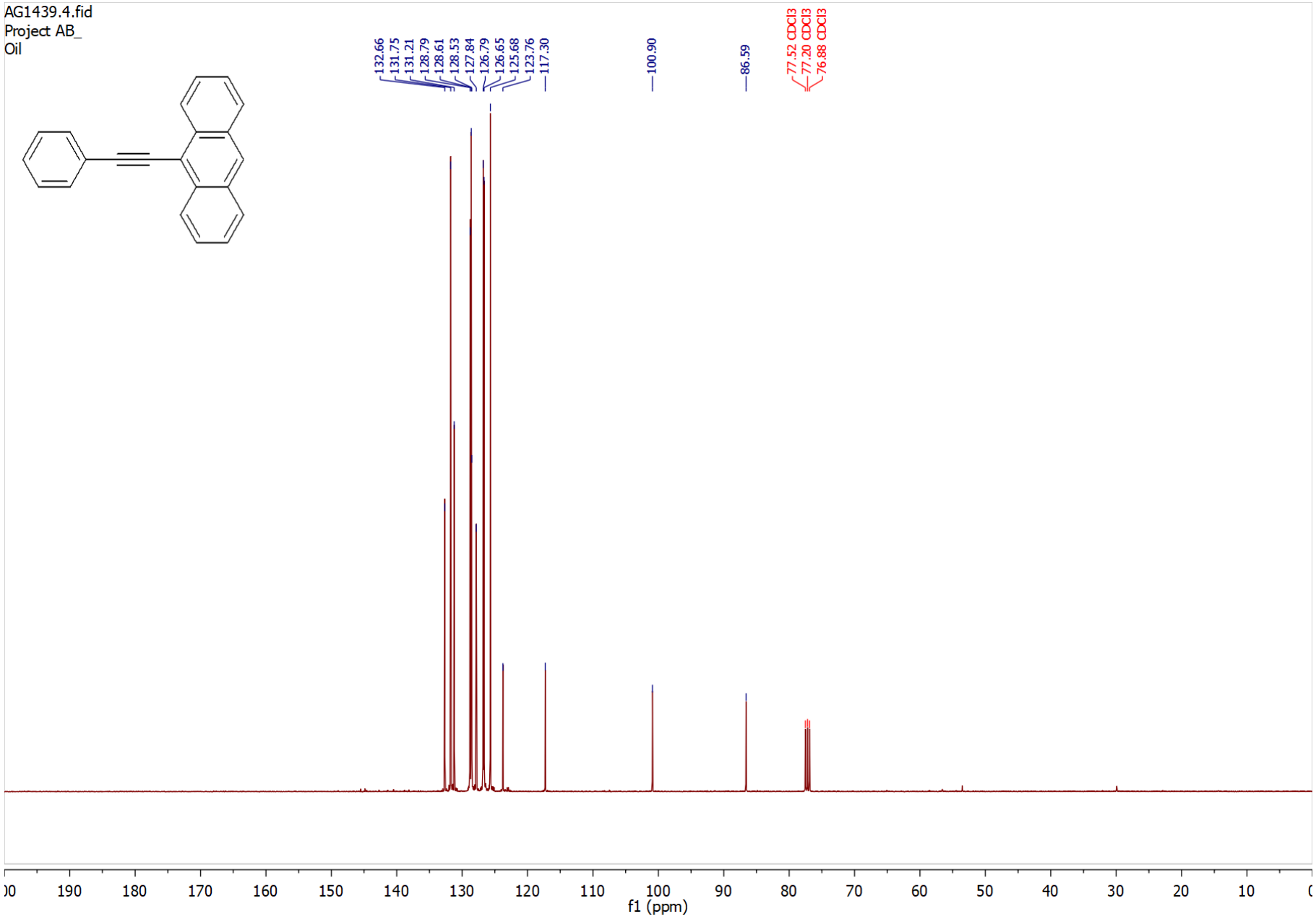
Compound 9n


AG1291.4.fid
Project AB_
Oil
133.15
132.92
131.80
131.58
128.55
128.53
128.44
128.15
127.91
127.90
126.78
126.67
123.45
120.72
90.03
89.96
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

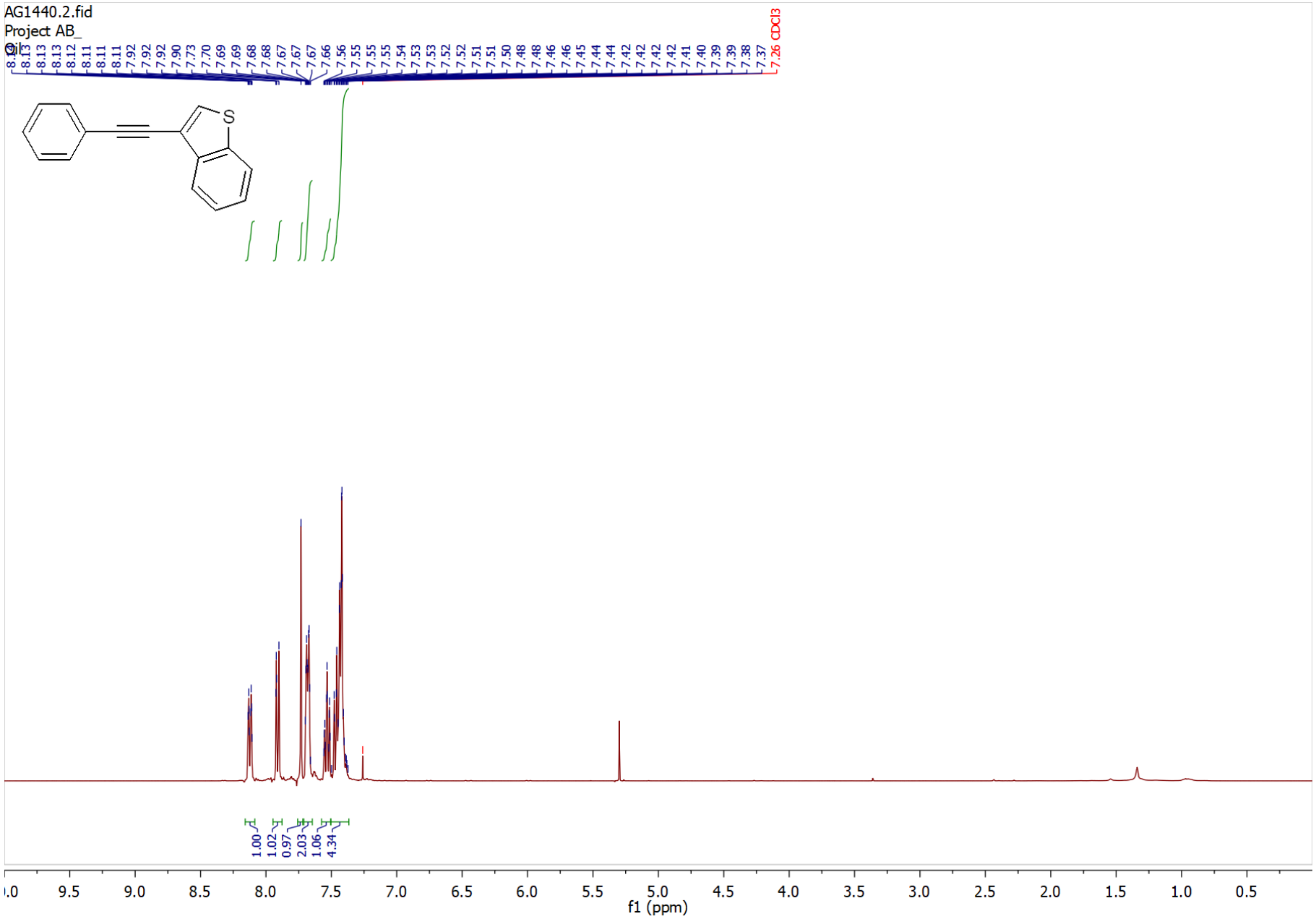
Compound 9o


AG1439.1.fid
Project AB_
Oil
8.85
8.84
8.82
8.82
8.41
8.06
8.04
7.95
7.95
7.94
7.93
7.93
7.93
7.92
7.74
7.74
7.73
7.72
7.72
7.70
7.70
7.61
7.61
7.60
7.59
7.59
7.59
7.58
7.58
7.57
7.57
7.56
7.55
7.55
7.55
7.54
7.53
7.52
7.52
7.51
7.50
7.50
7.49
7.26 CDCl3
2.00
1.00
2.04
2.03
2.09
5.16
f1 (ppm)

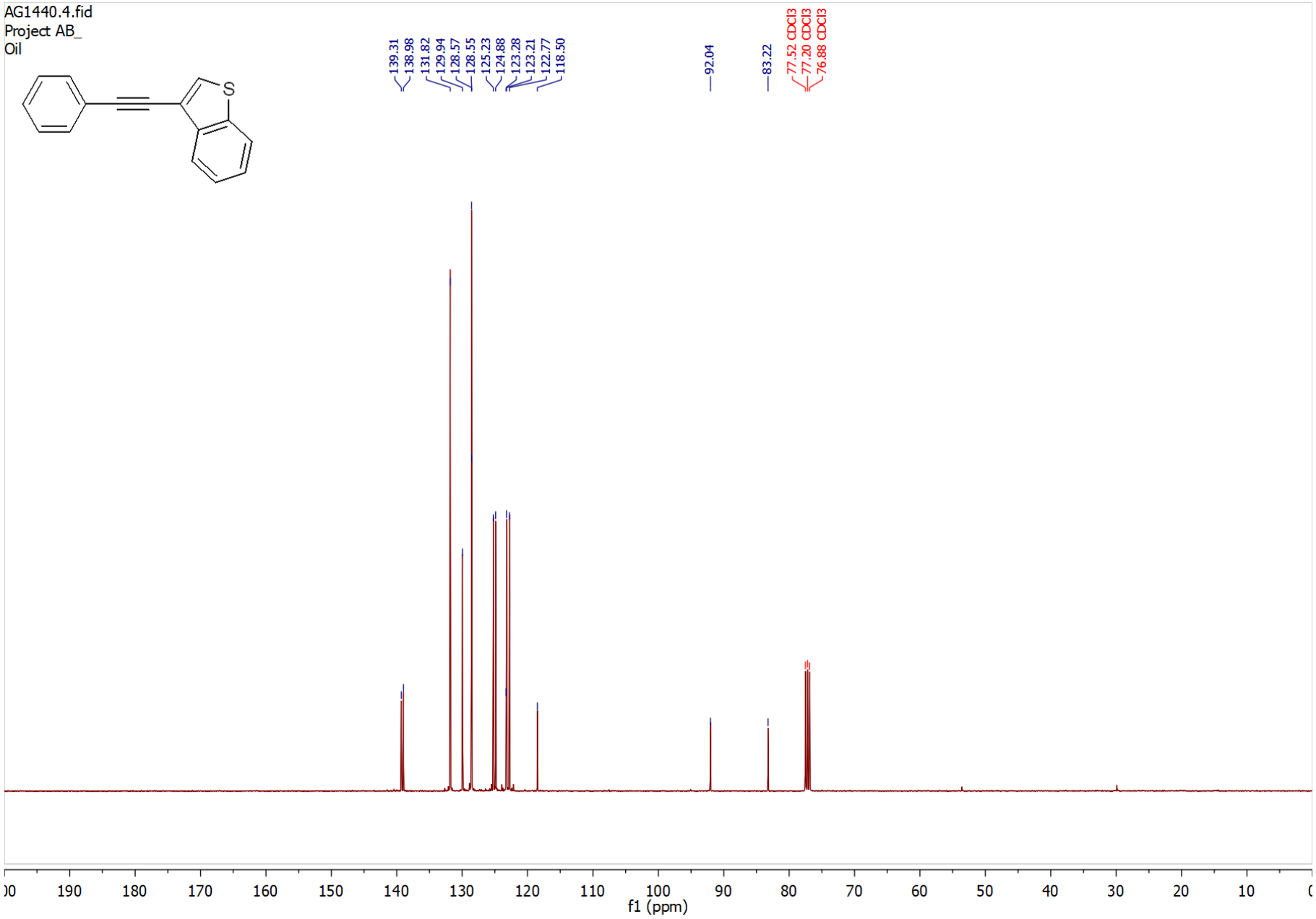
Compound 9o


AG1439.4.fid
Project AB_
Oil
132.66
131.75
131.21
128.79
128.61
128.53
127.84
126.79
126.65
125.68
123.76
117.30
100.90
86.59
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

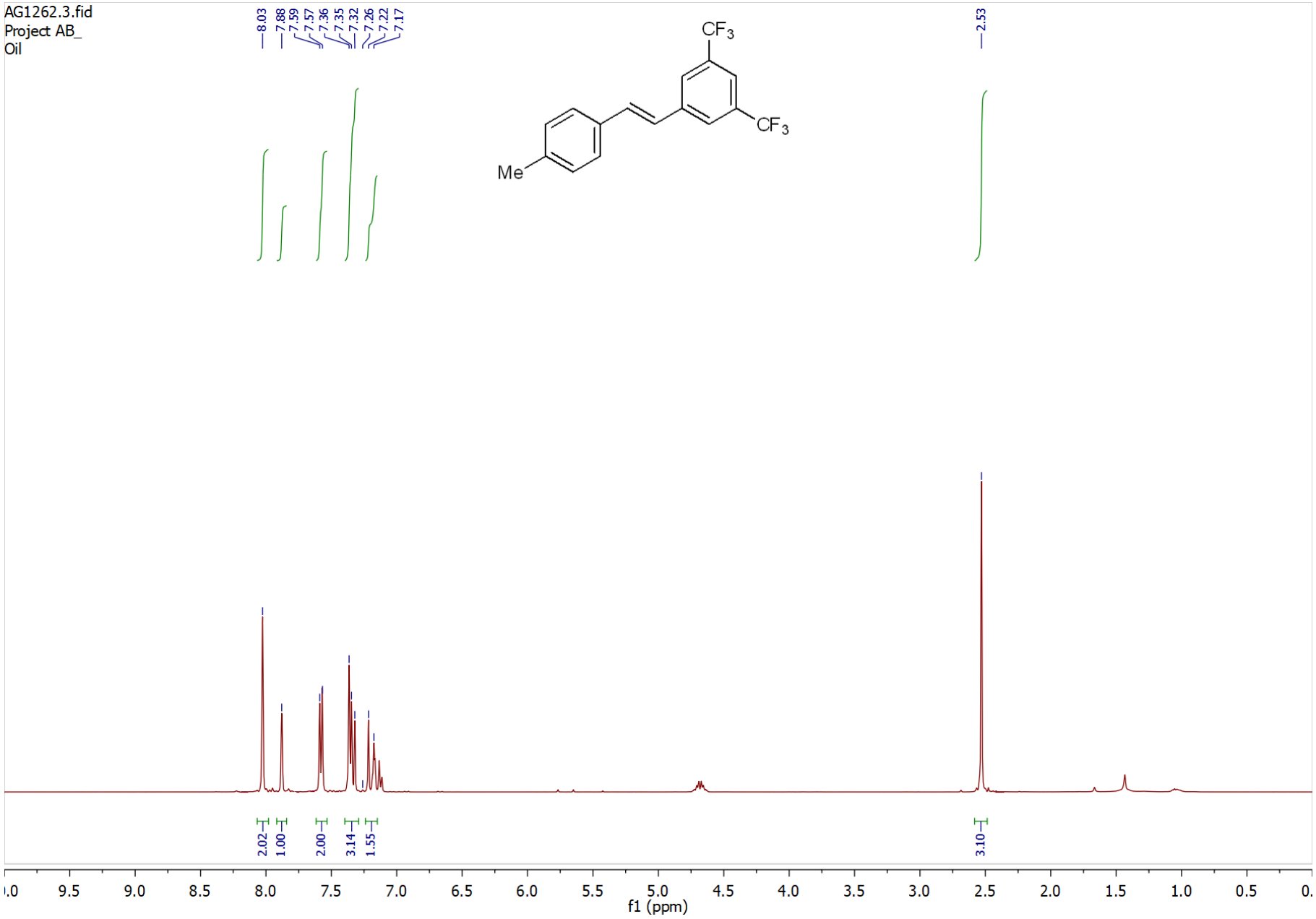
Compound 9p


AG1440.2.fid
Project AB_
CDCl3
7.26 CDCl3
S
1.00
1.02
0.97
2.03
1.06
4.34
f1 (ppm)

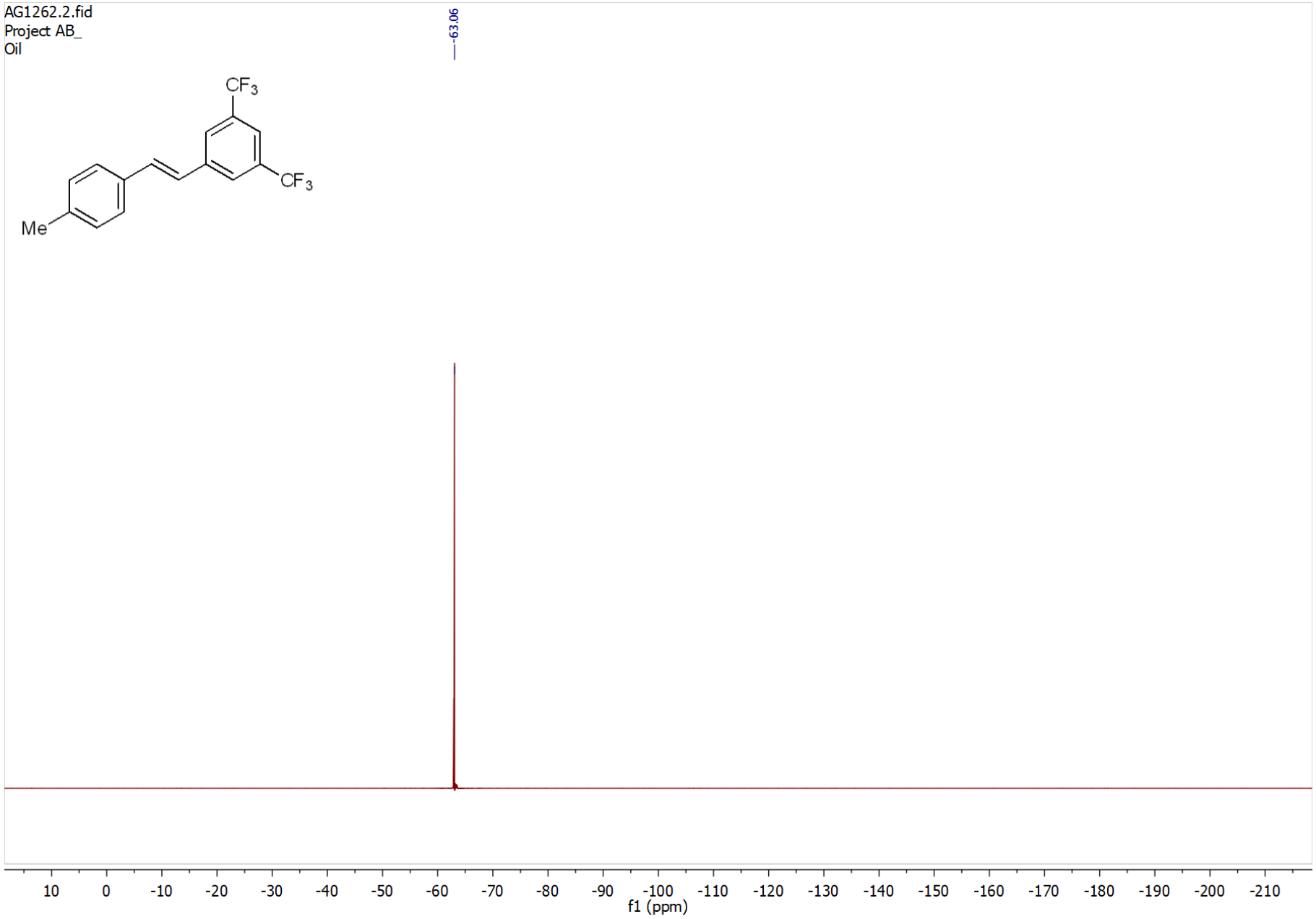
Compound 9p


AG1440.4.fid
Project AB_
Oil
S
139.31
138.98
131.82
129.94
128.57
128.55
125.23
124.88
123.28
123.21
122.77
118.50
92.04
83.22
77.52 CDCl3
77.20 CDCl3
76.88 CDCl3
f1 (ppm)

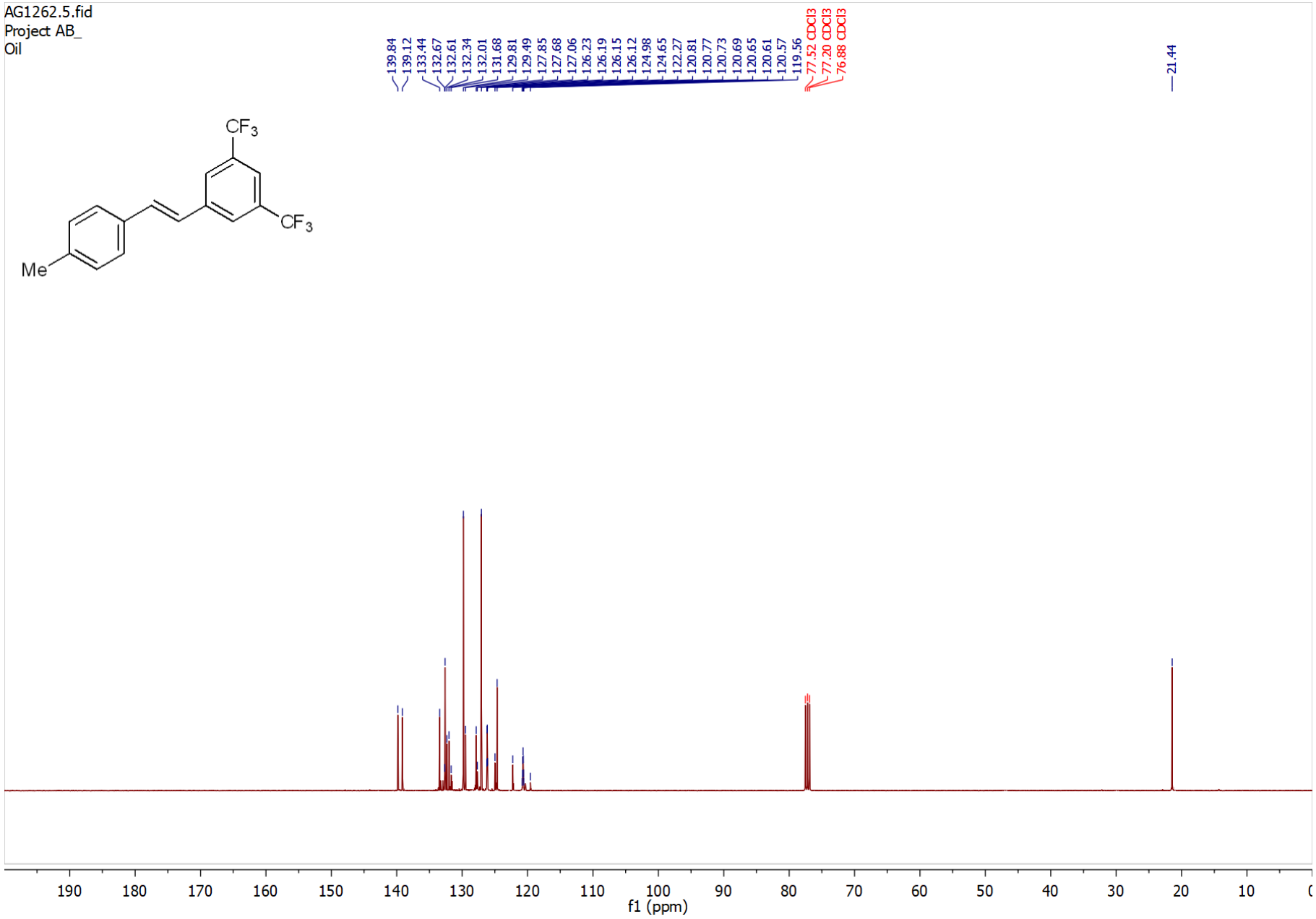
Compound 11a



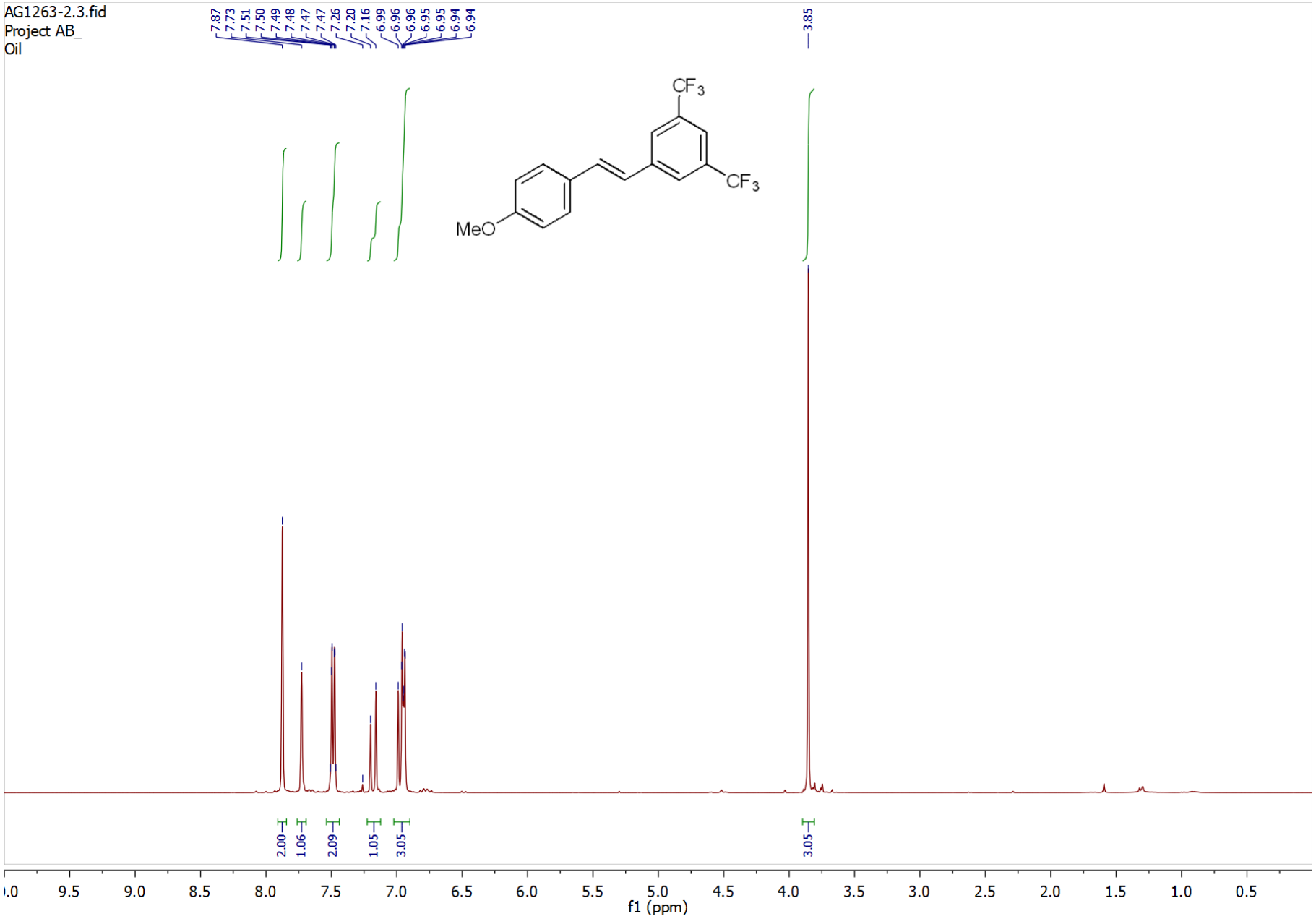
Compound 11a



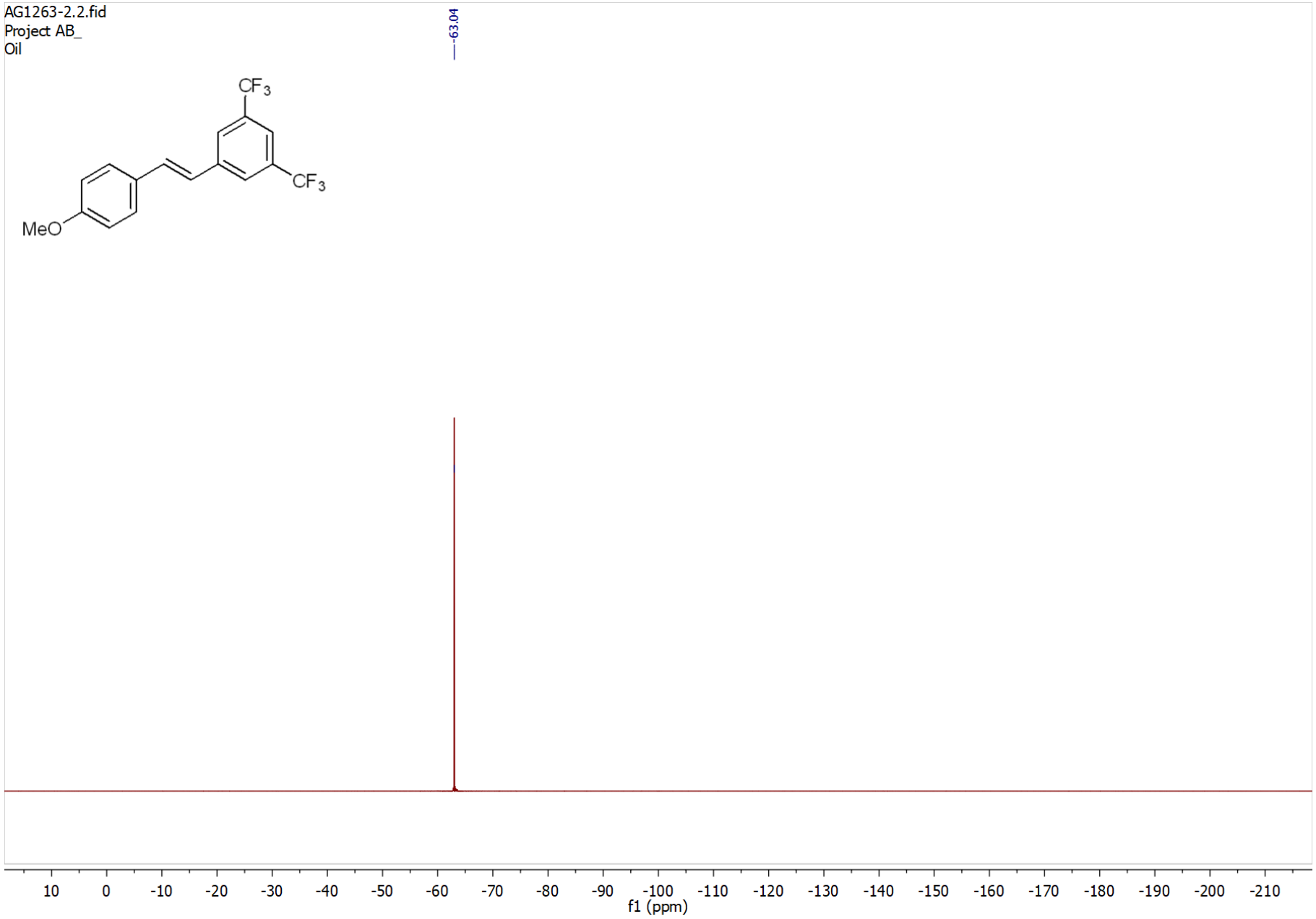
Compound 11a



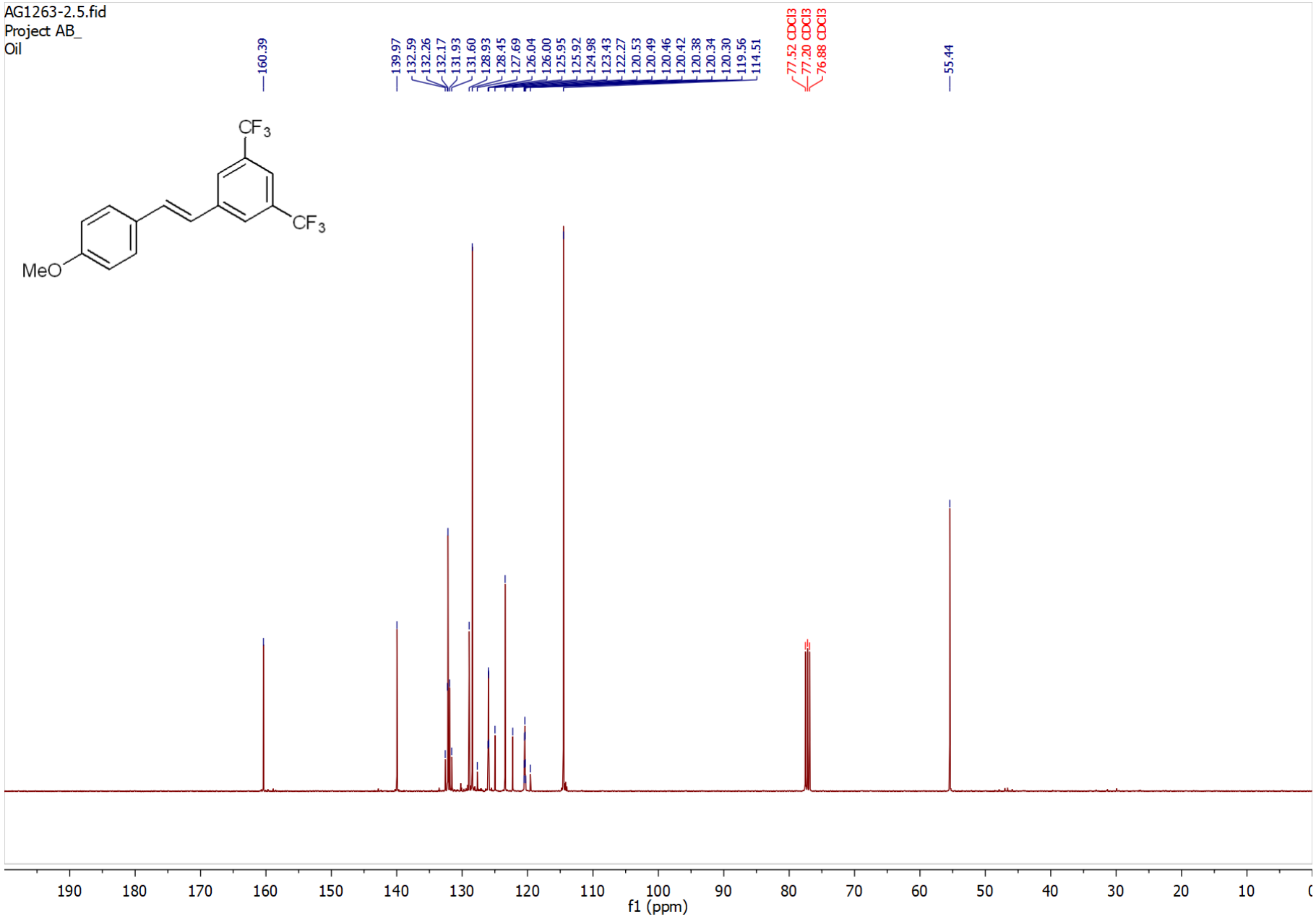
Compound 11b



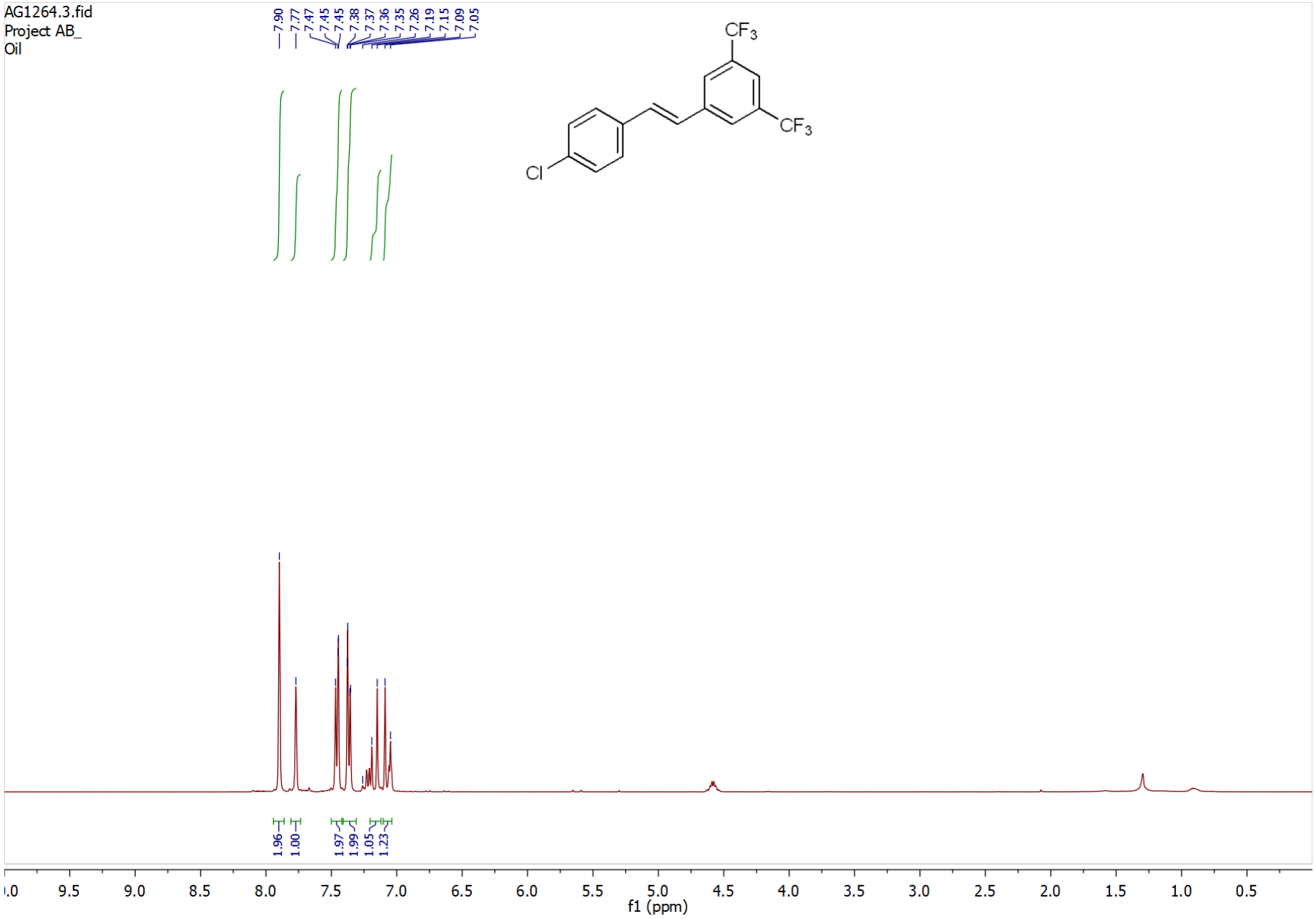
Compound 11b



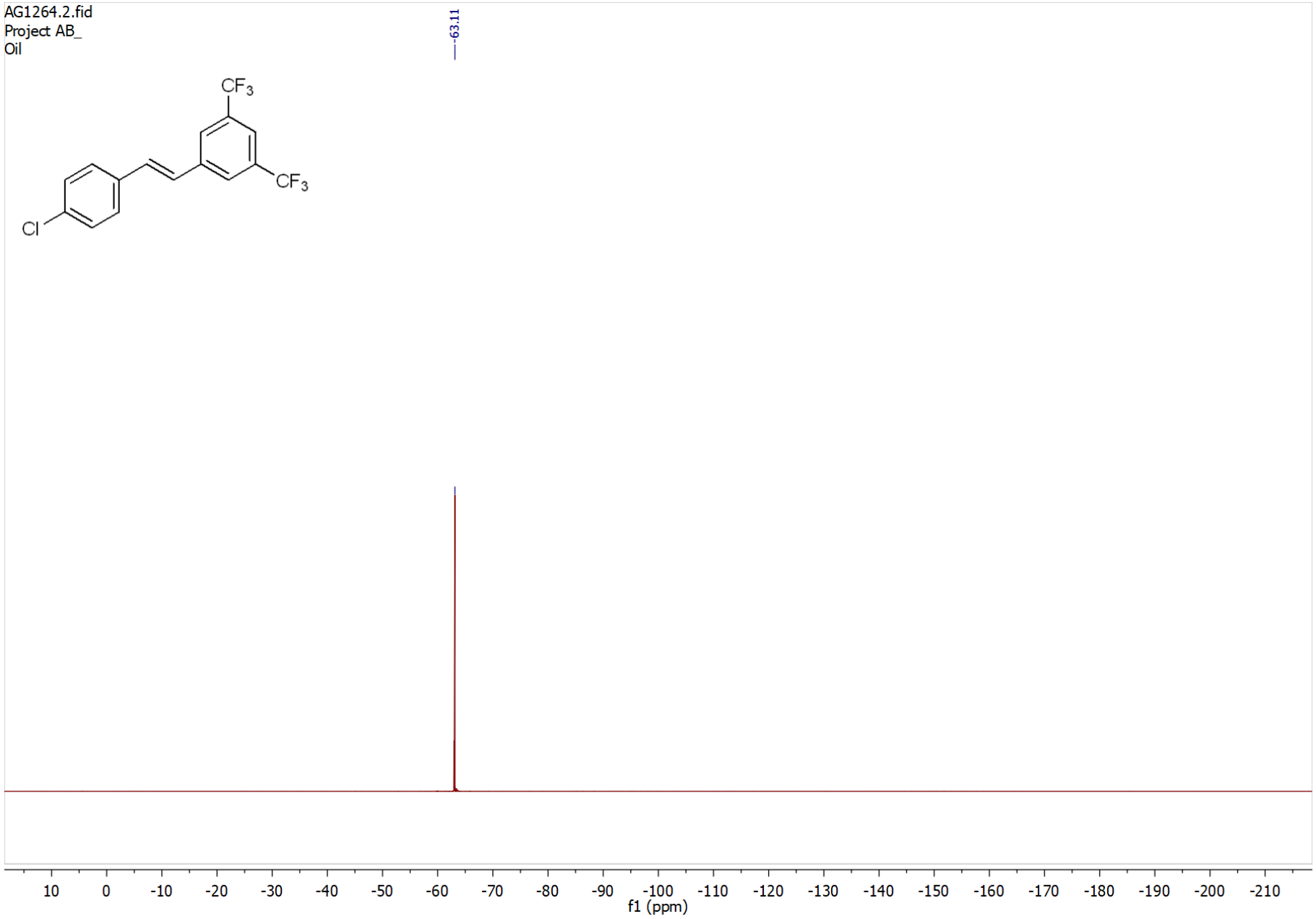
Compound 11b



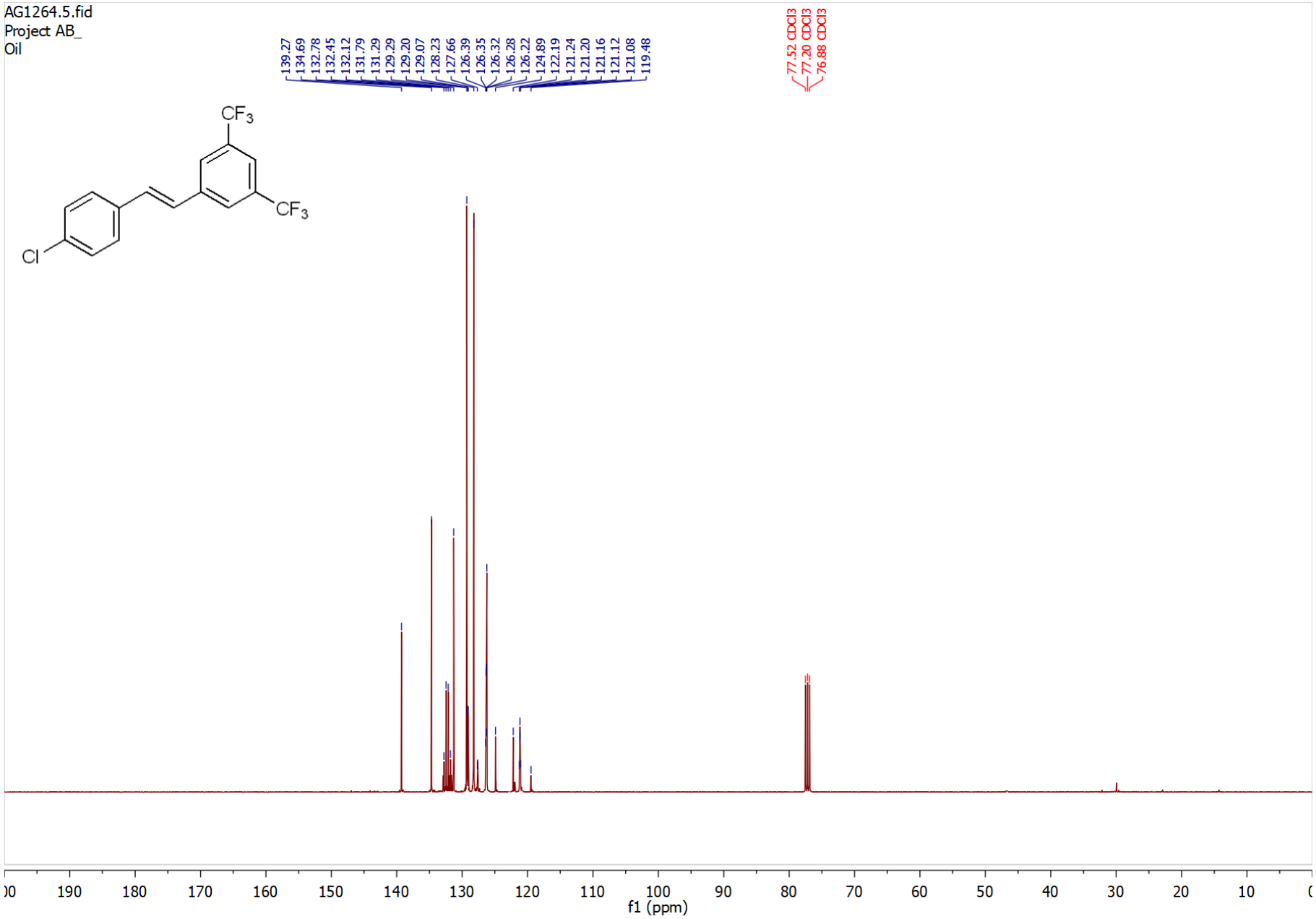
Compound 11c



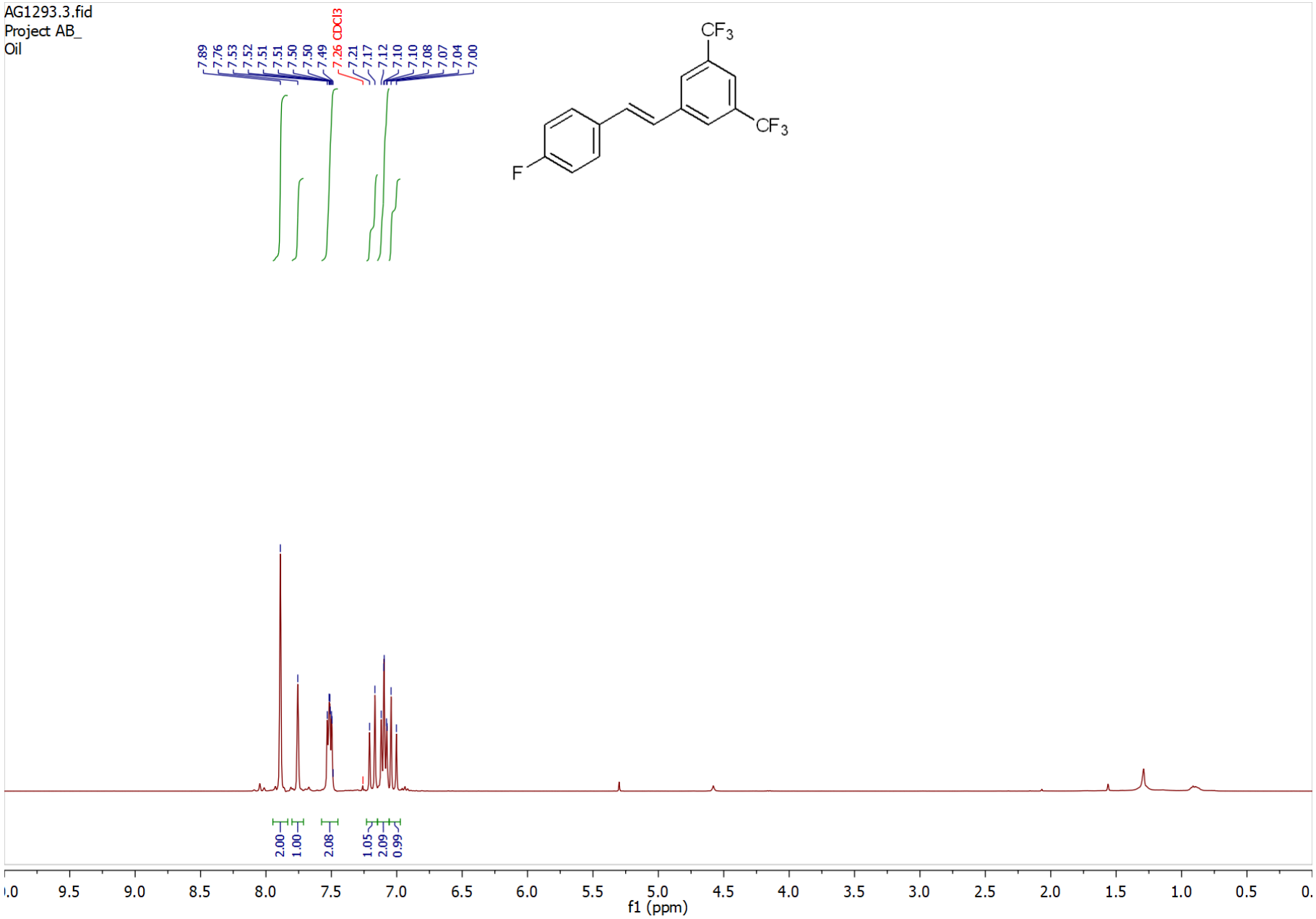
Compound 11c



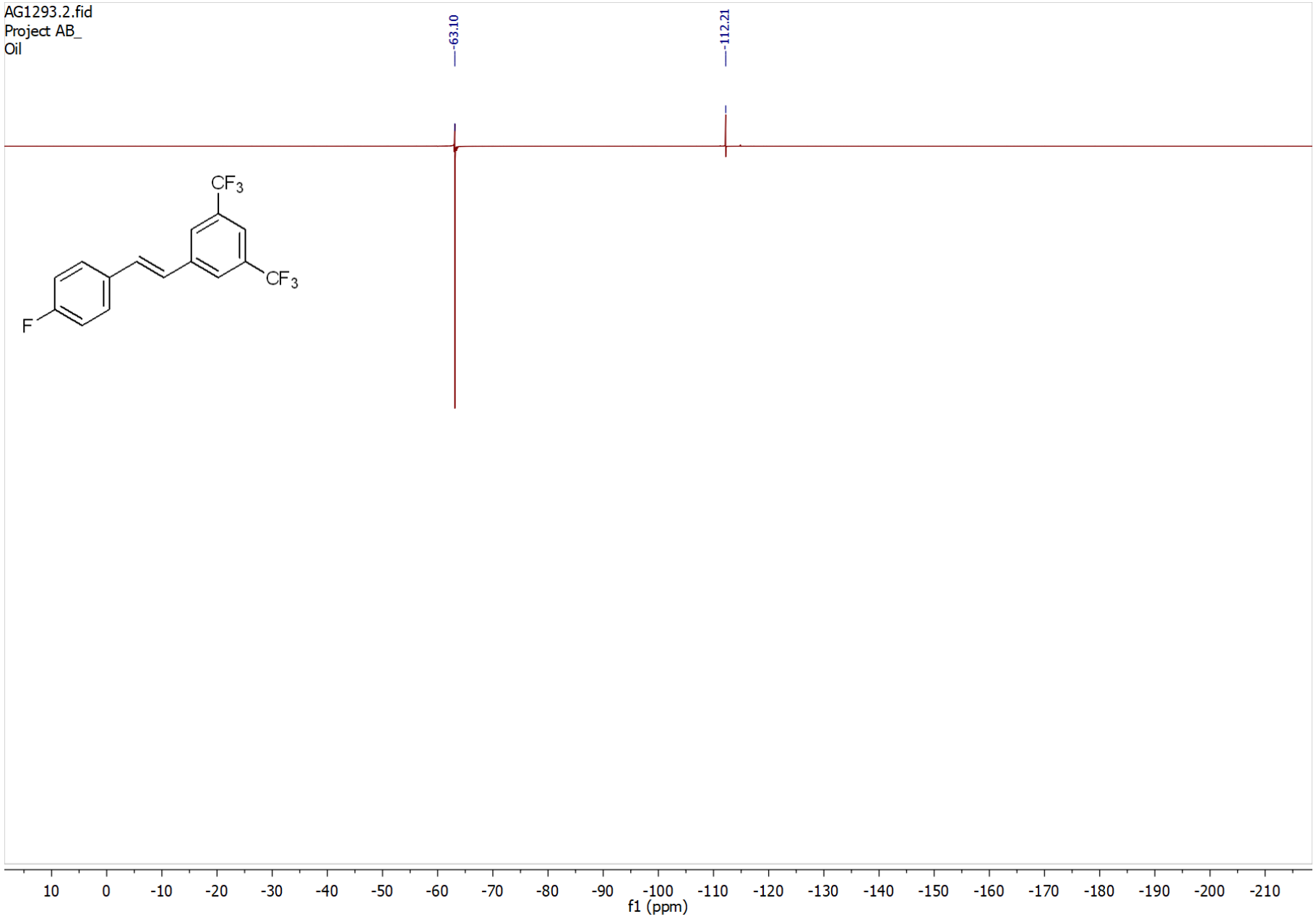
Compound 11c



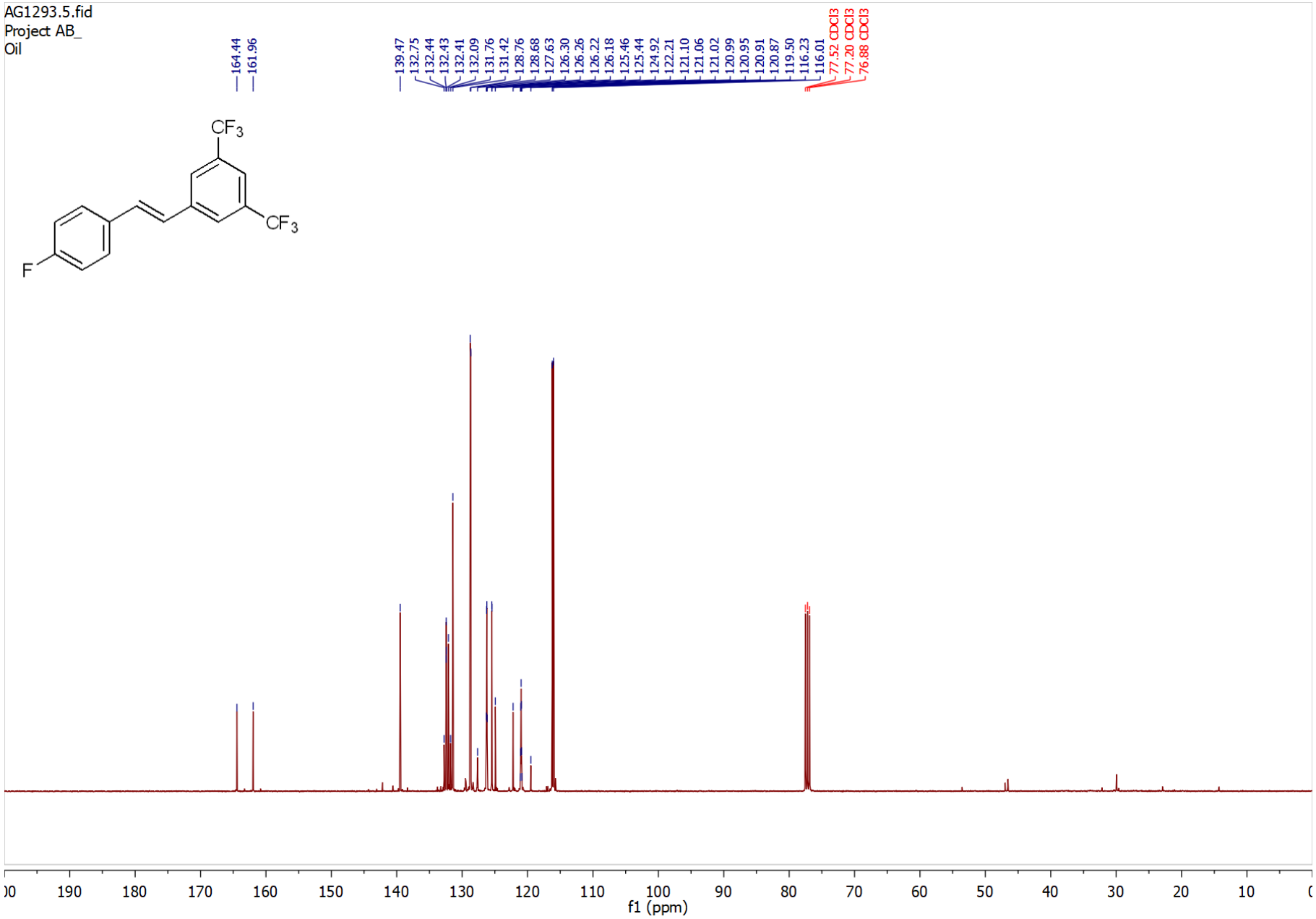
Compound 11d



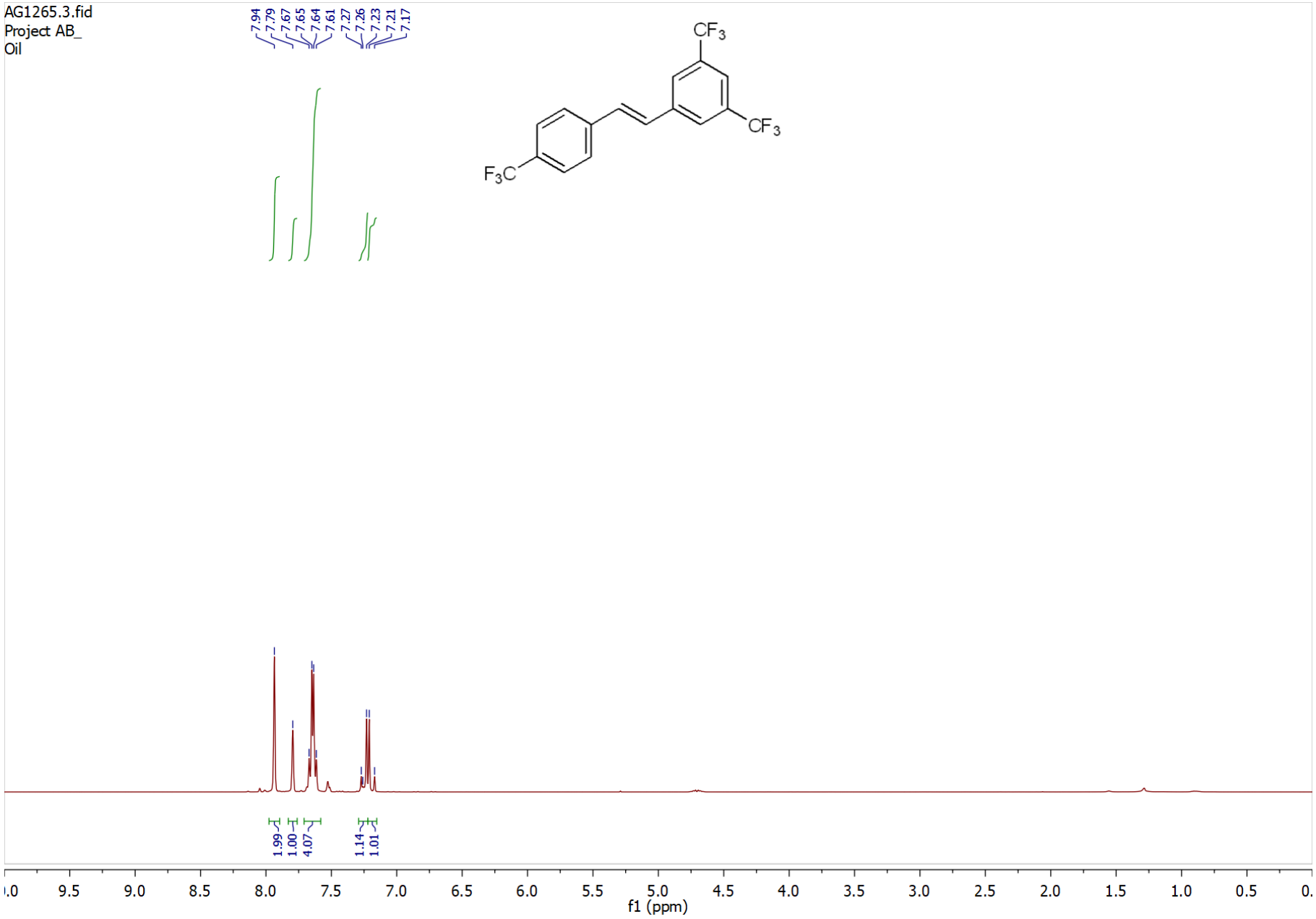
Compound 11d



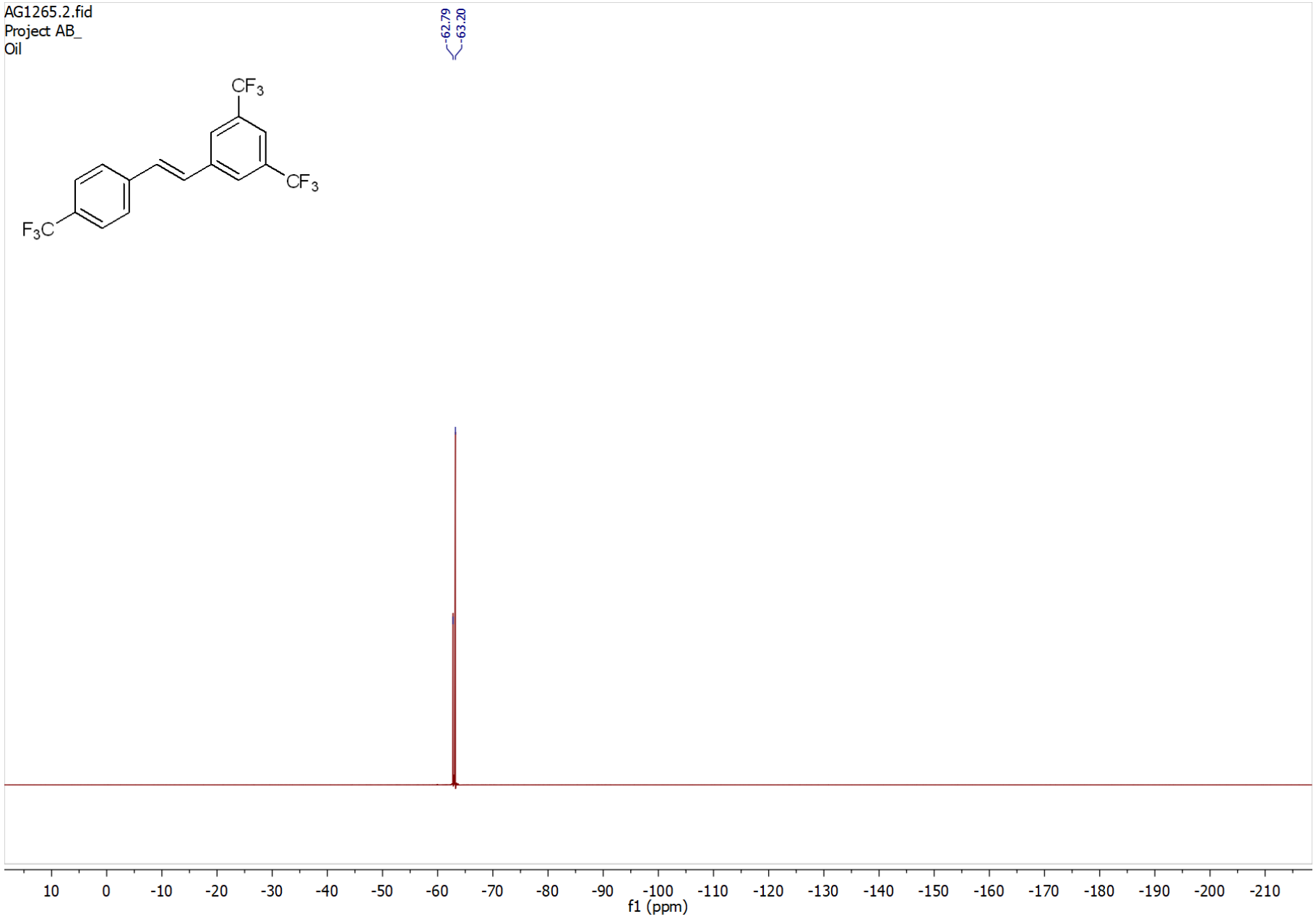
Compound 11d



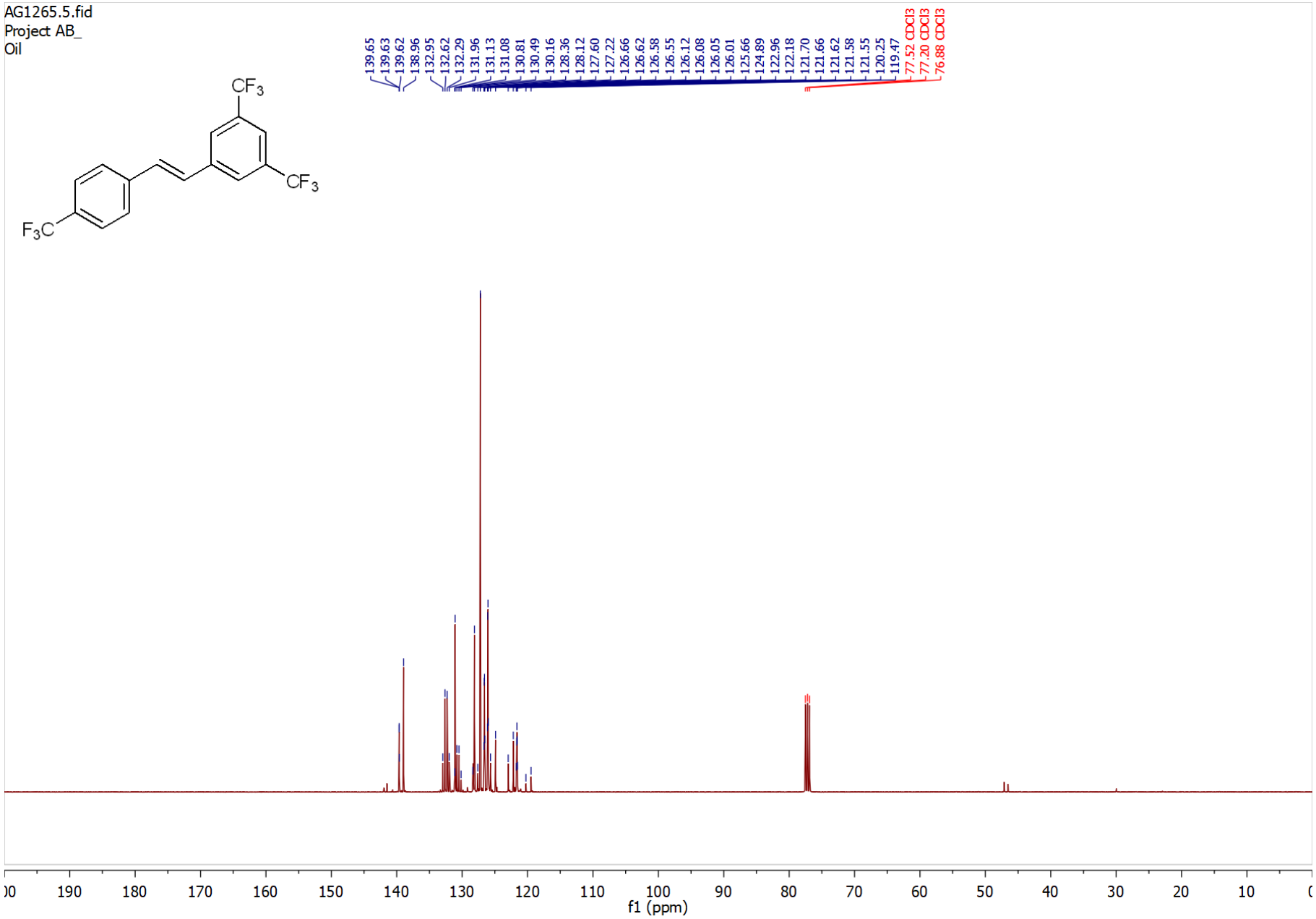
Compound 11e



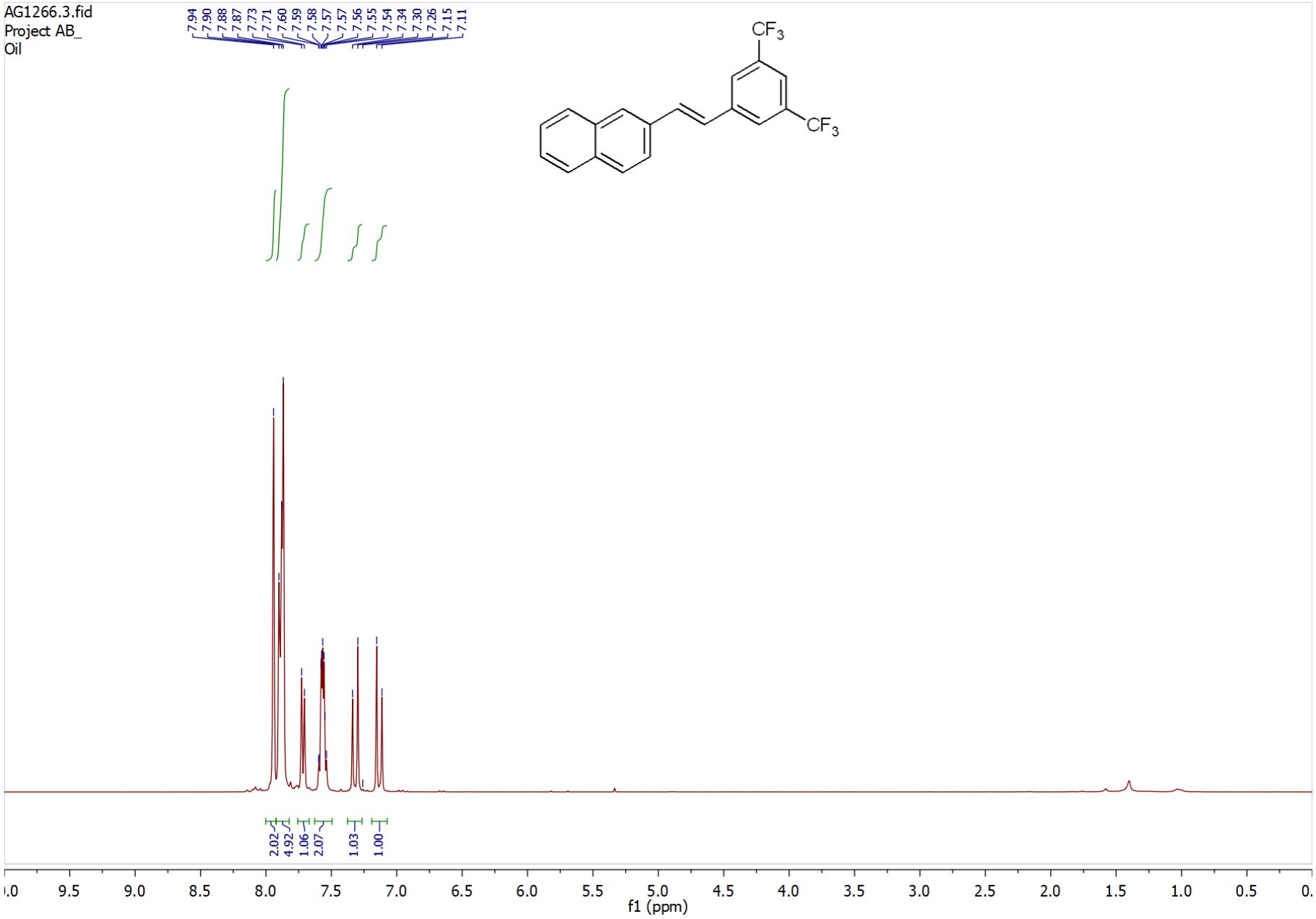
Compound 11e



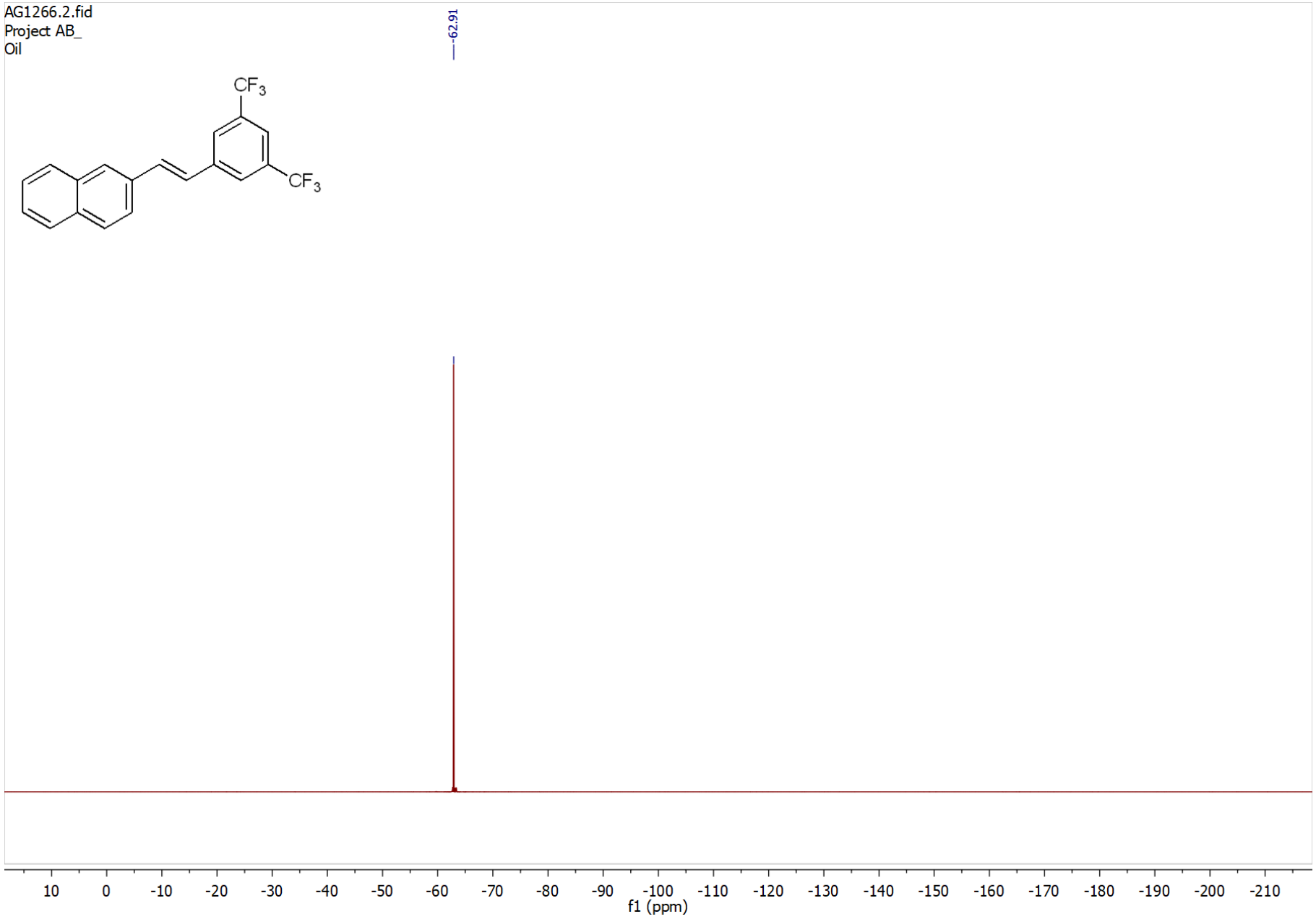
Compound 11e



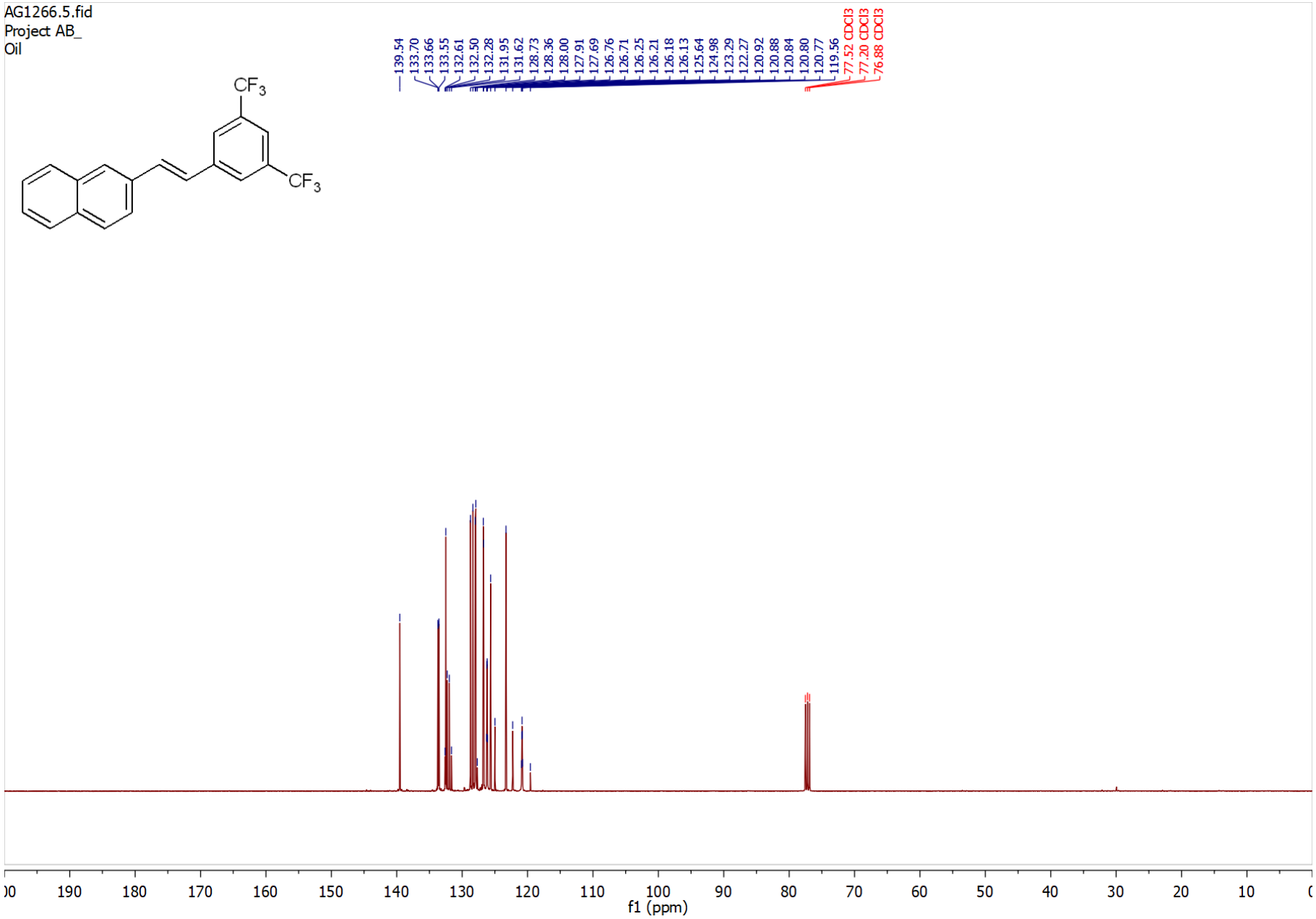
Compound 11f



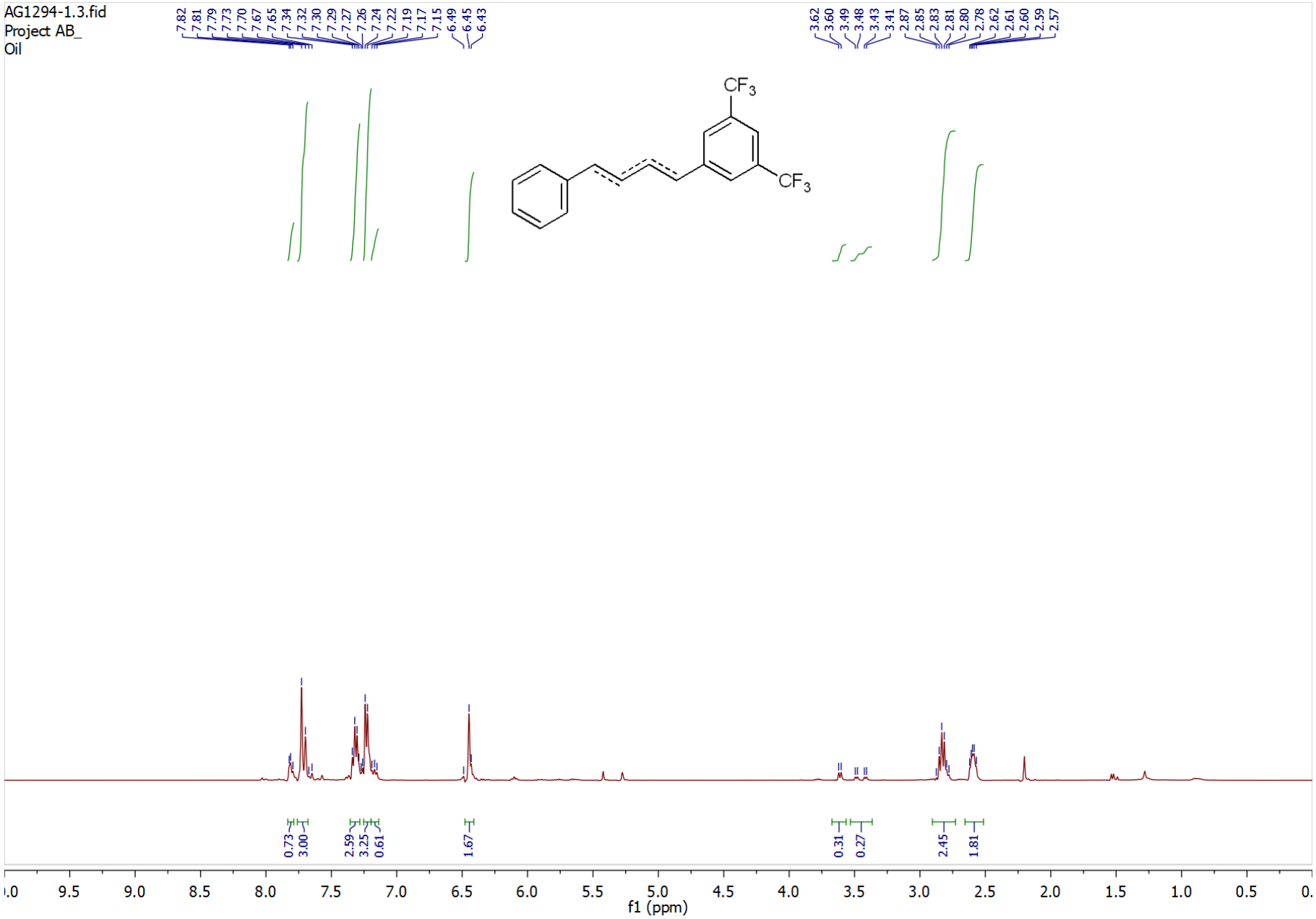
Compound 11f



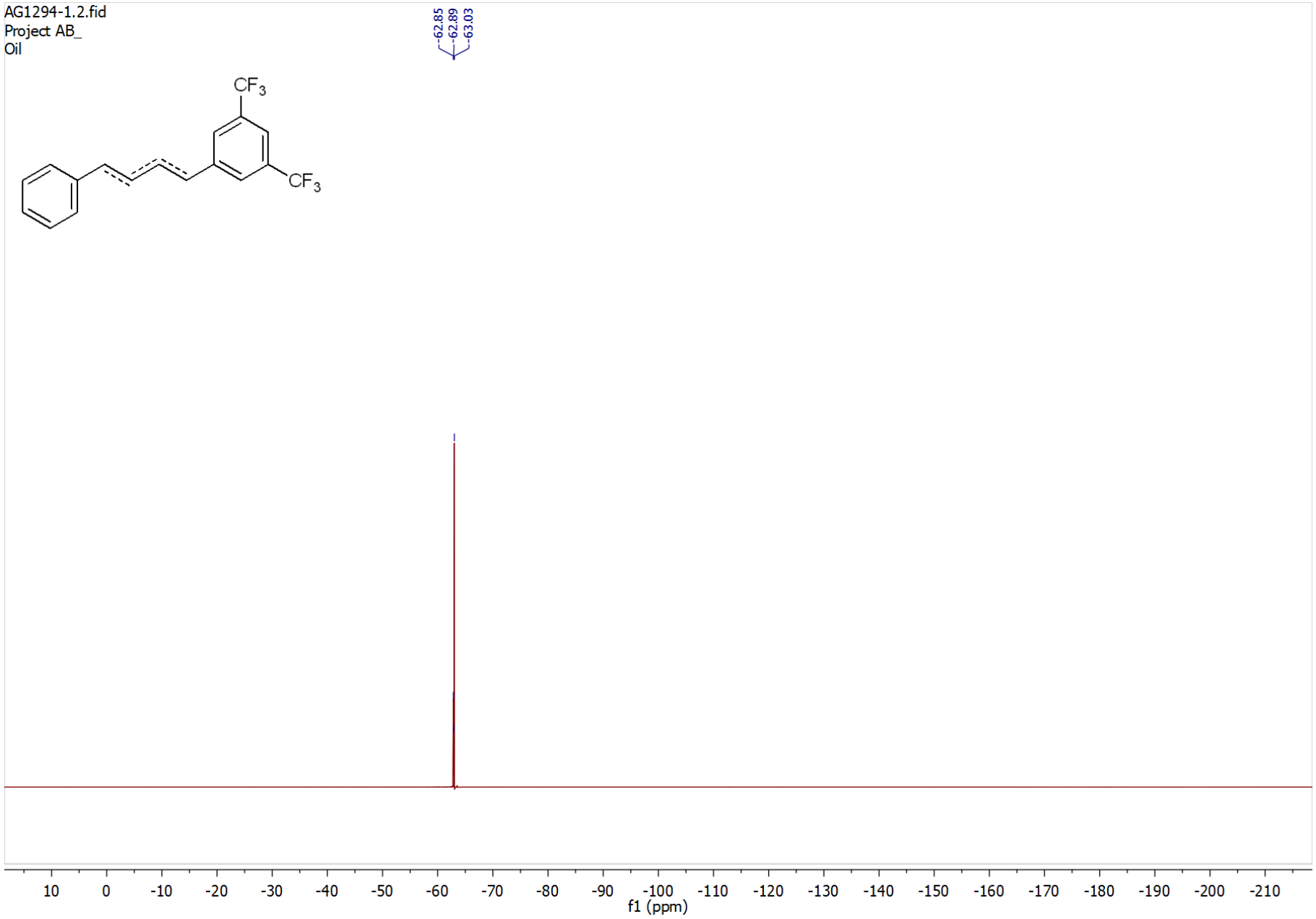
Compound 11f



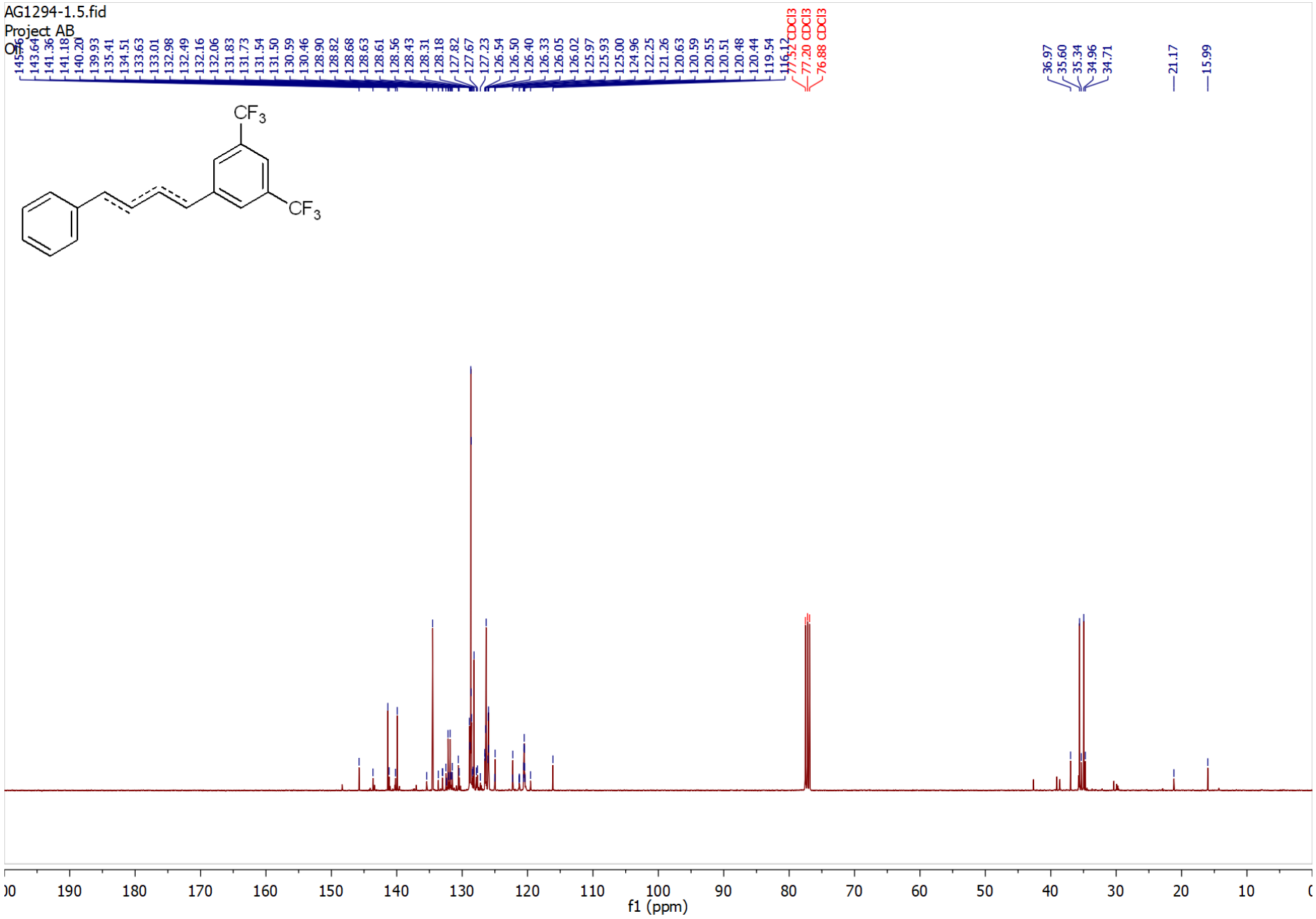
Compound 11g, fraction 1



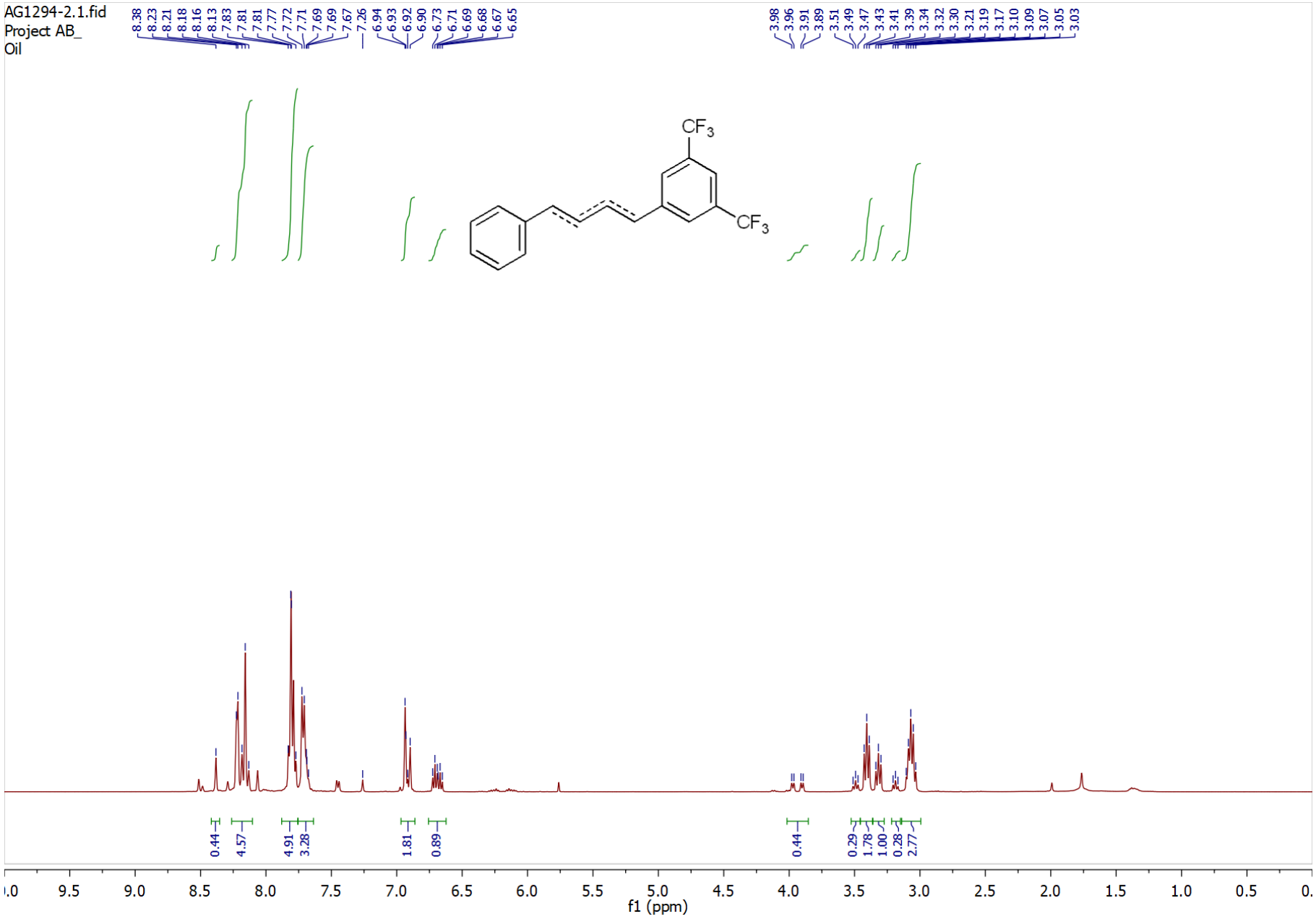
Compound 11g, fraction 1



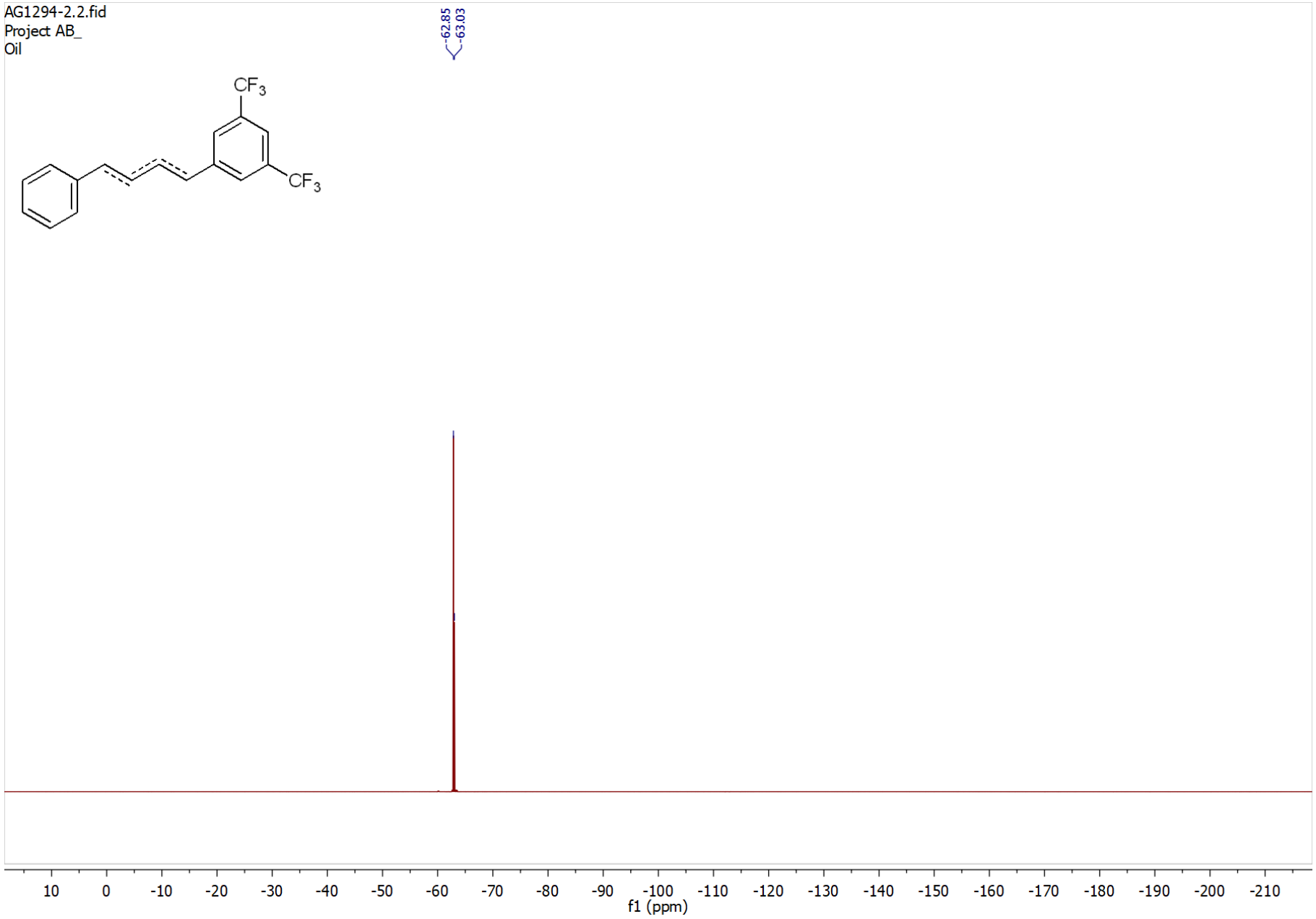
Compound 11g, fraction 1



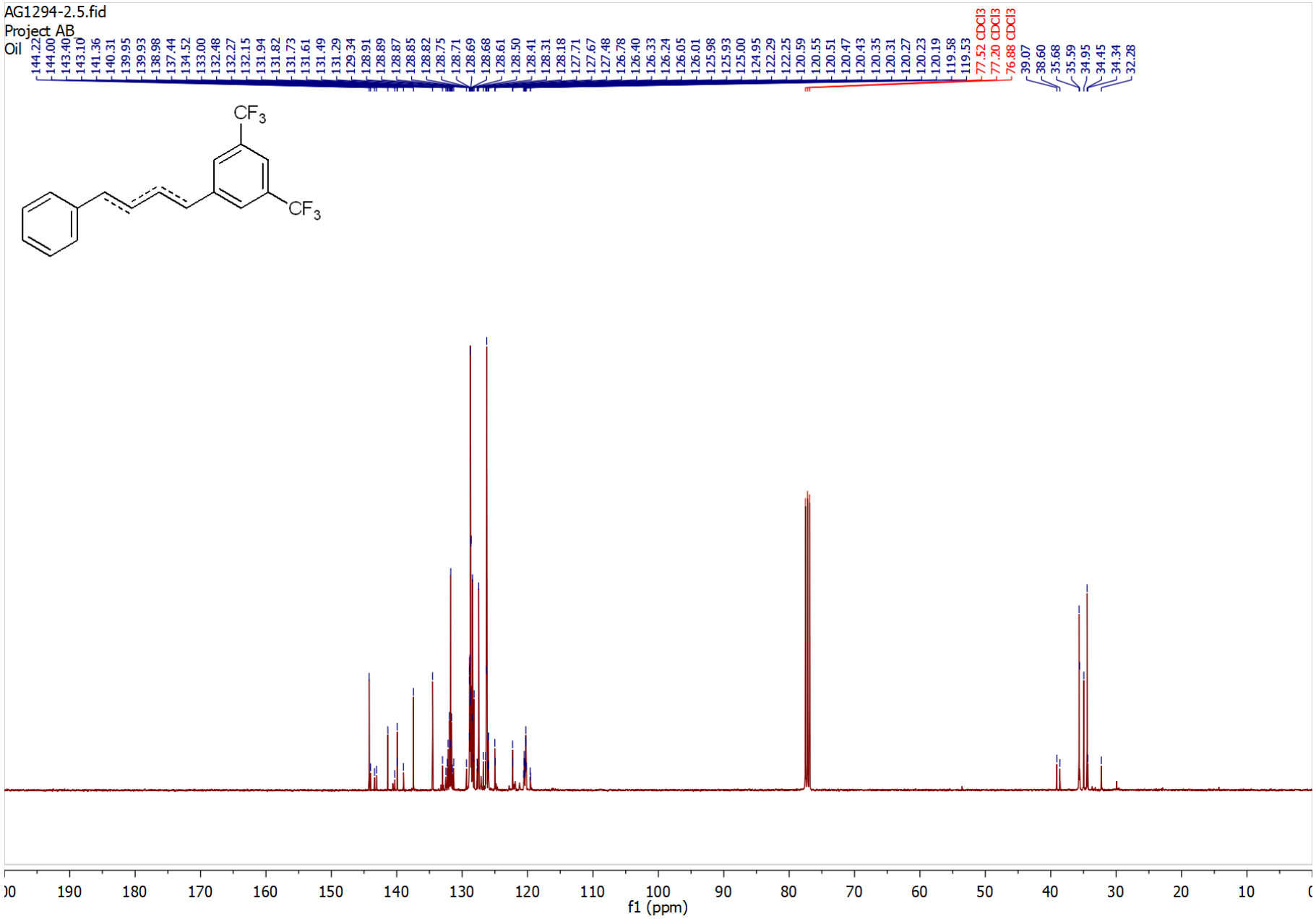
Compound 11g, fraction 2



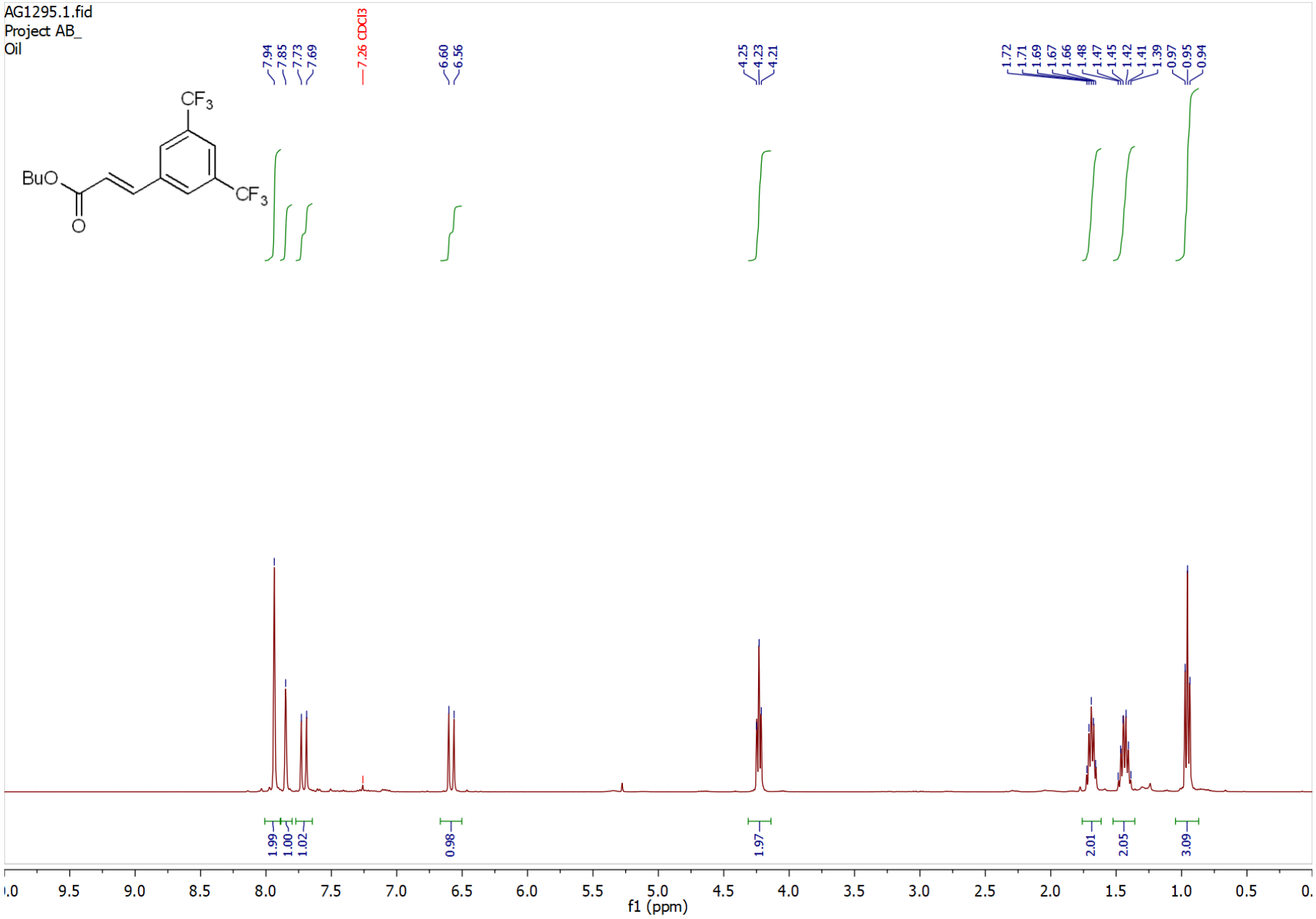
Compound 11g, fraction 2



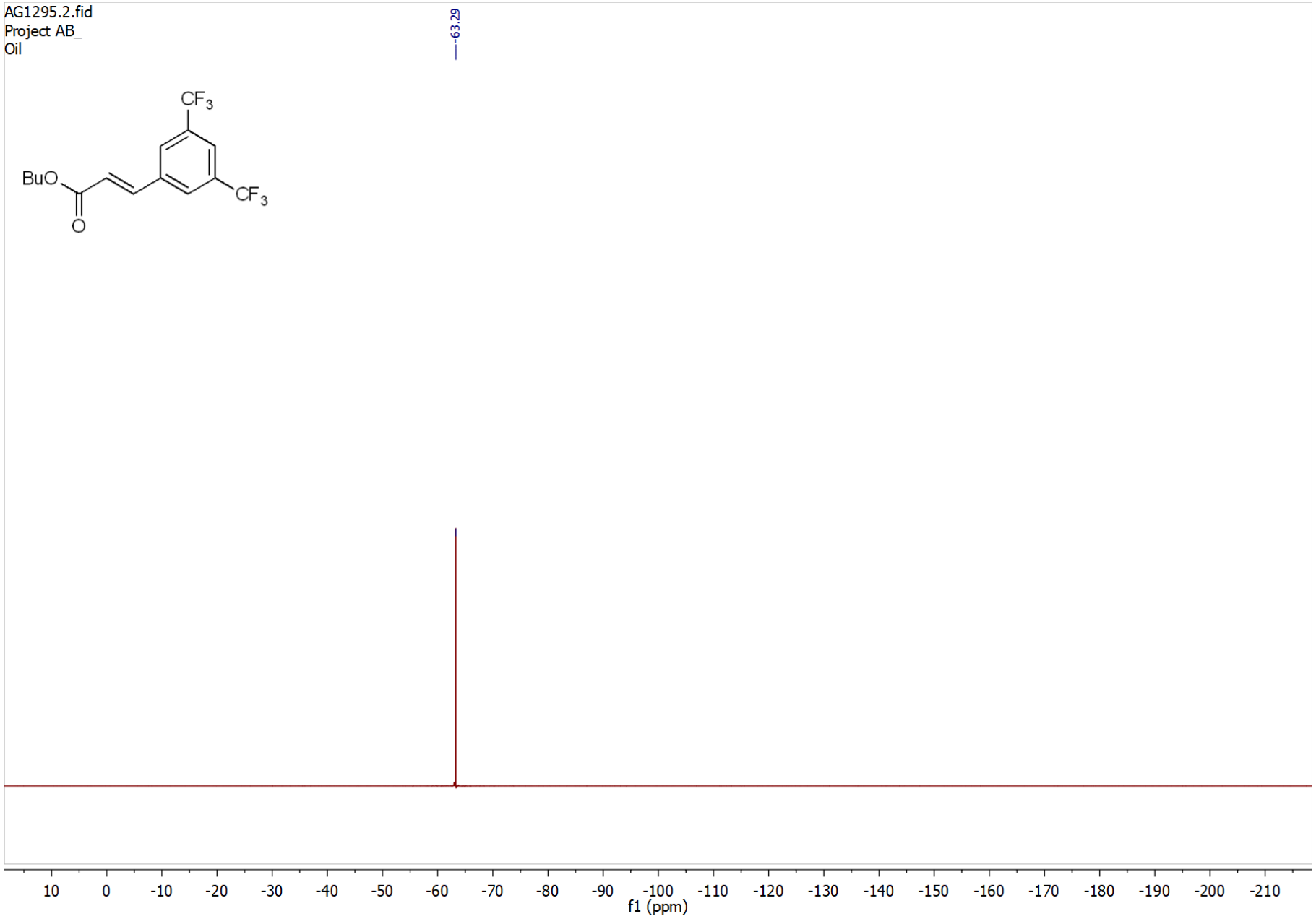
Compound 11g, fraction 2



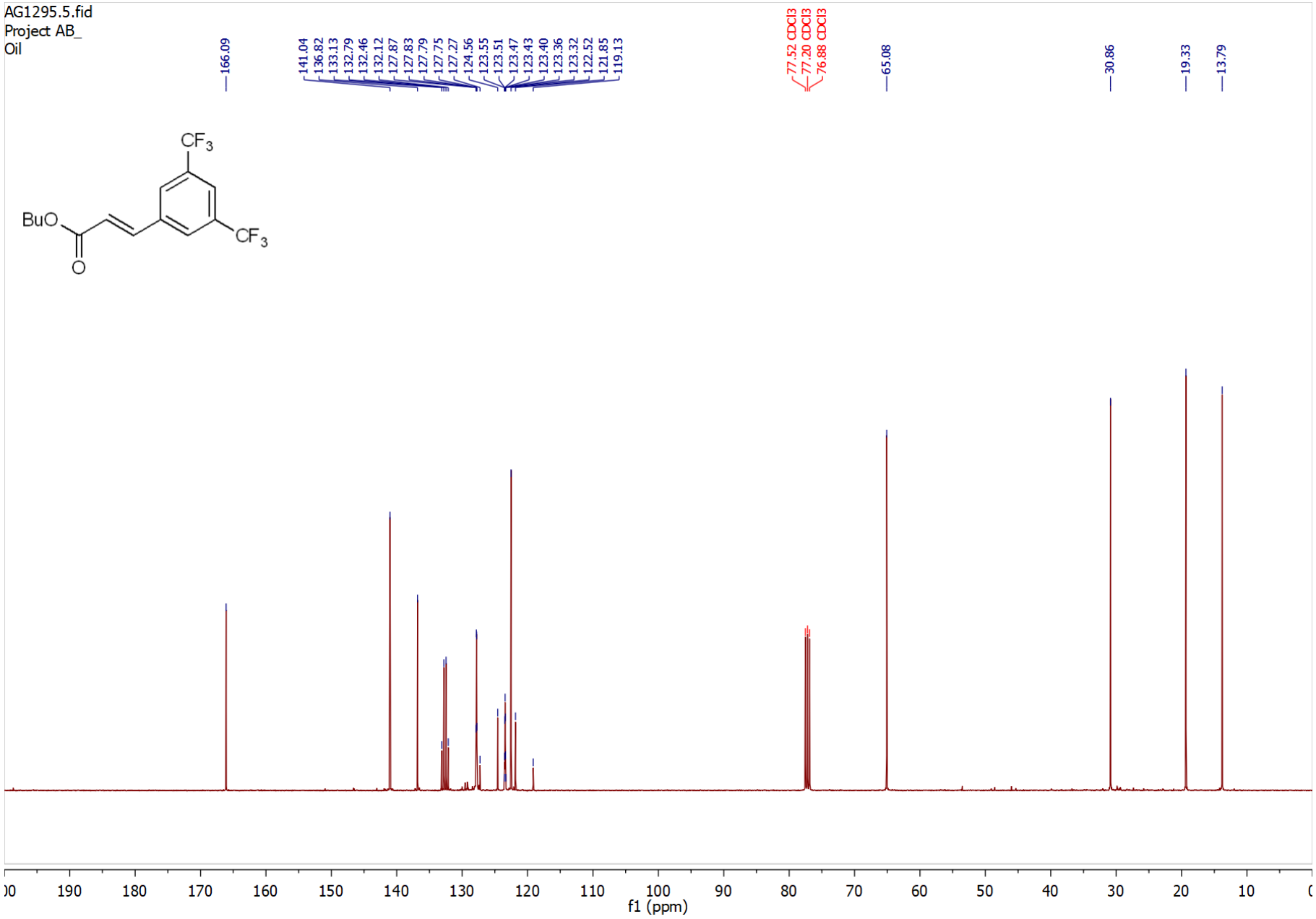
Compound 11h



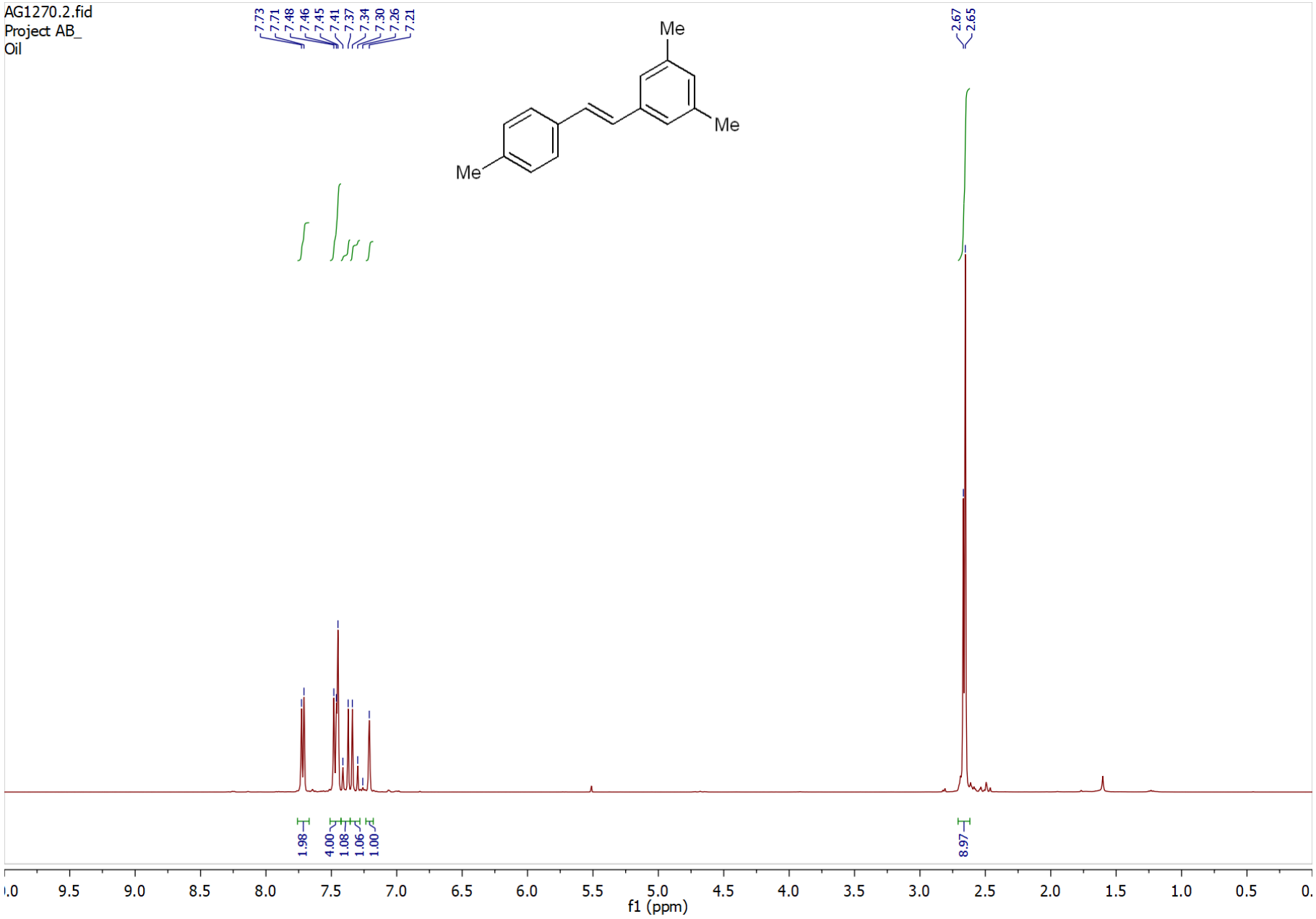
Compound 11h



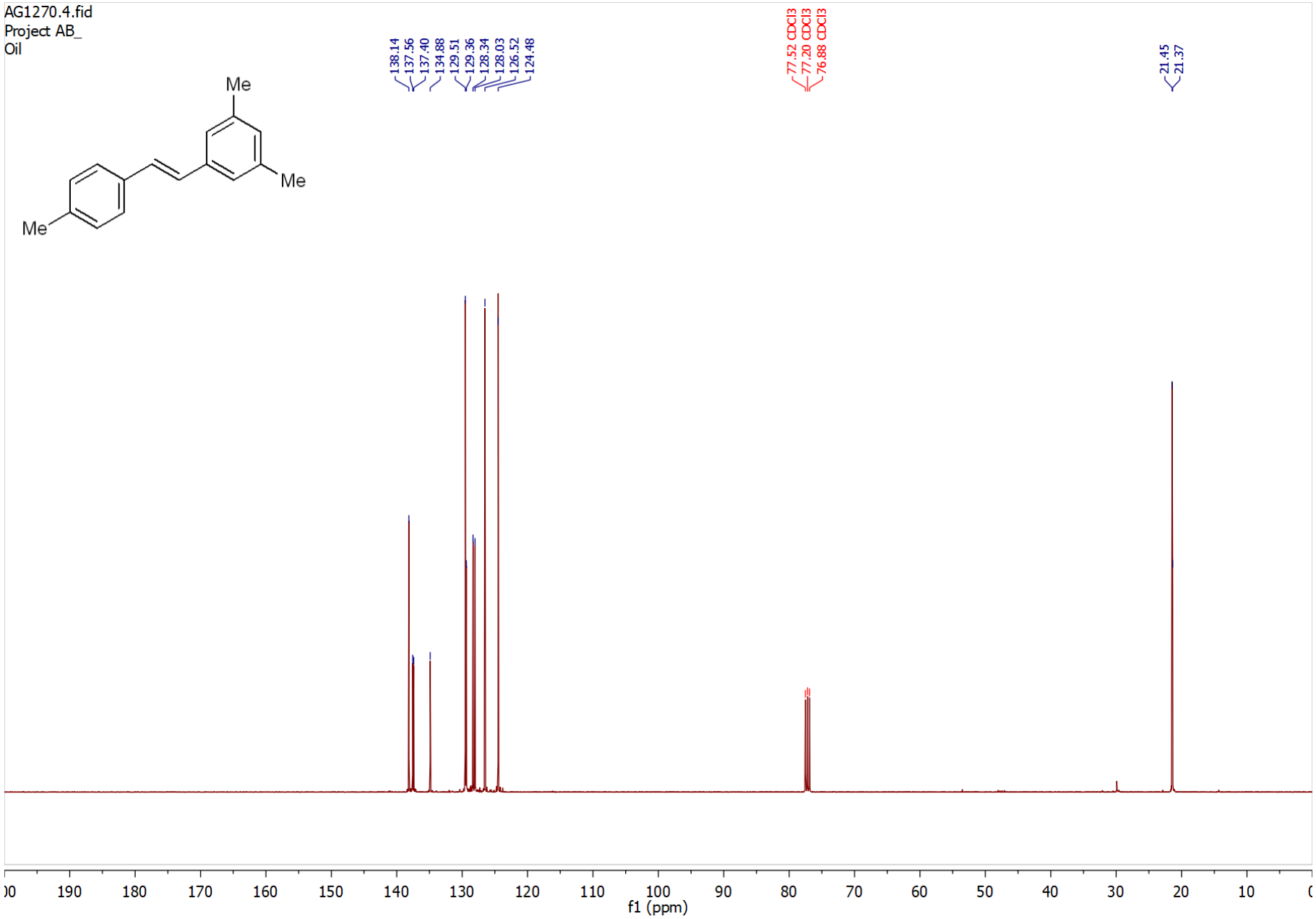
Compound 11h



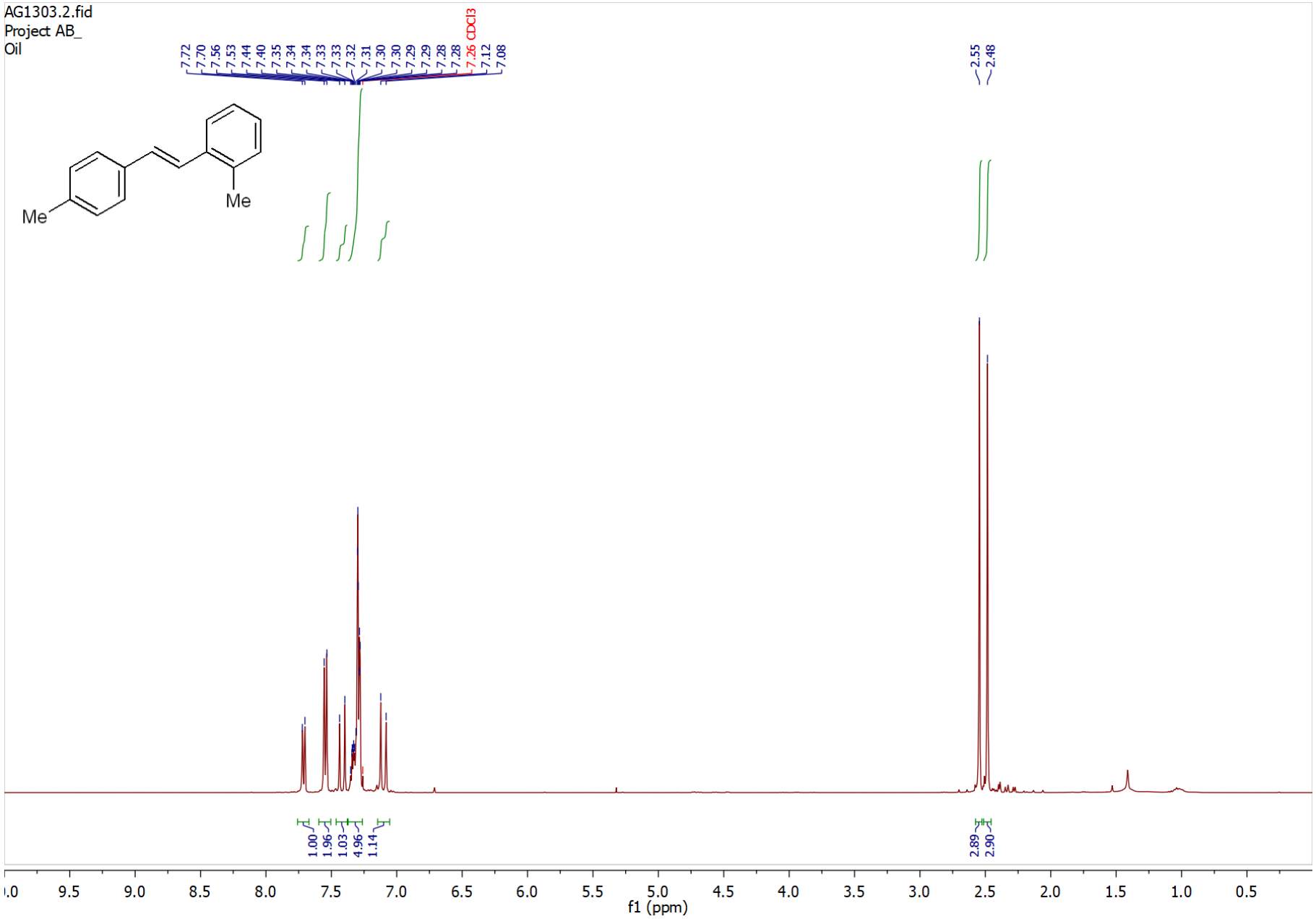
Compound 11k



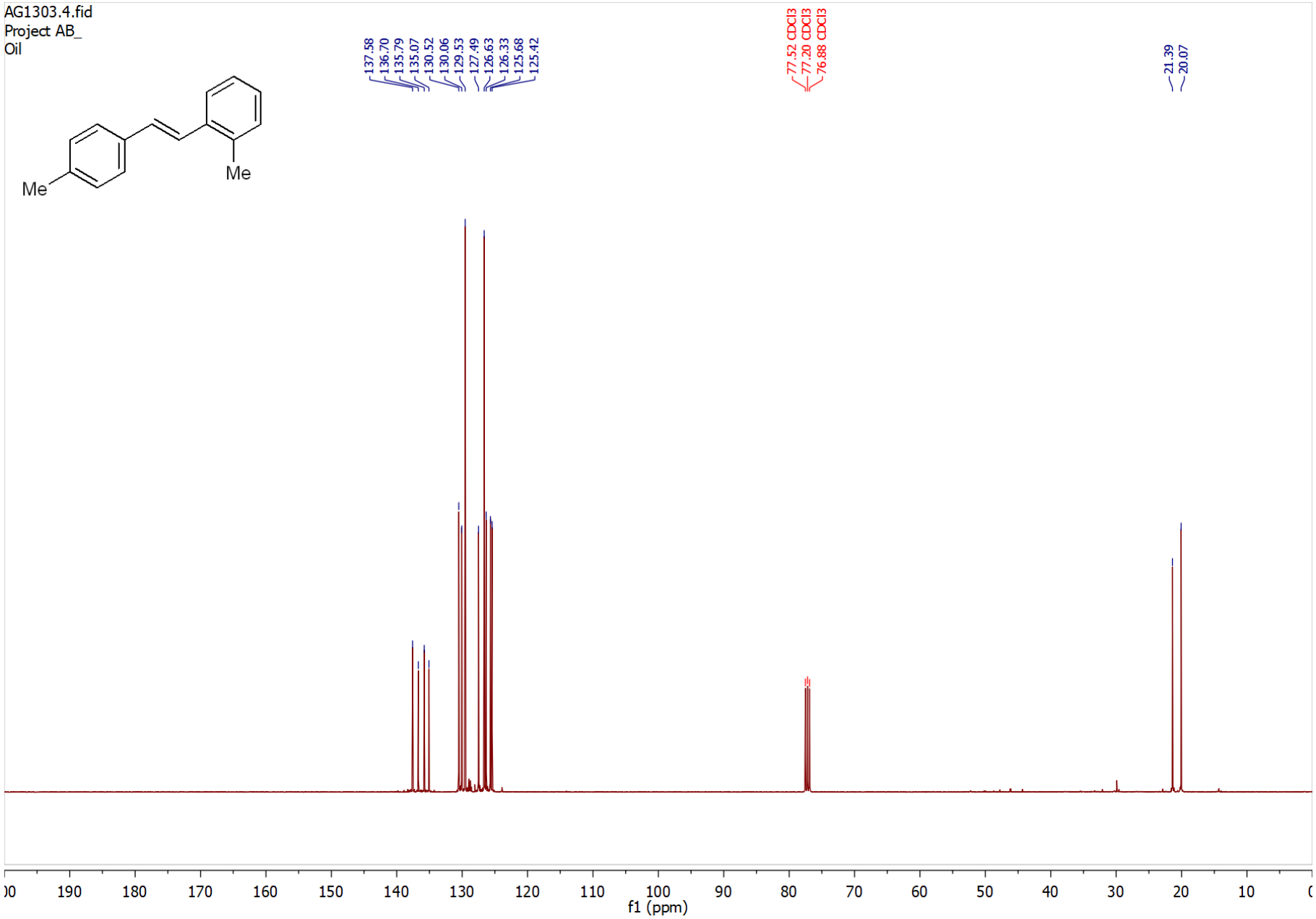
Compound 11k



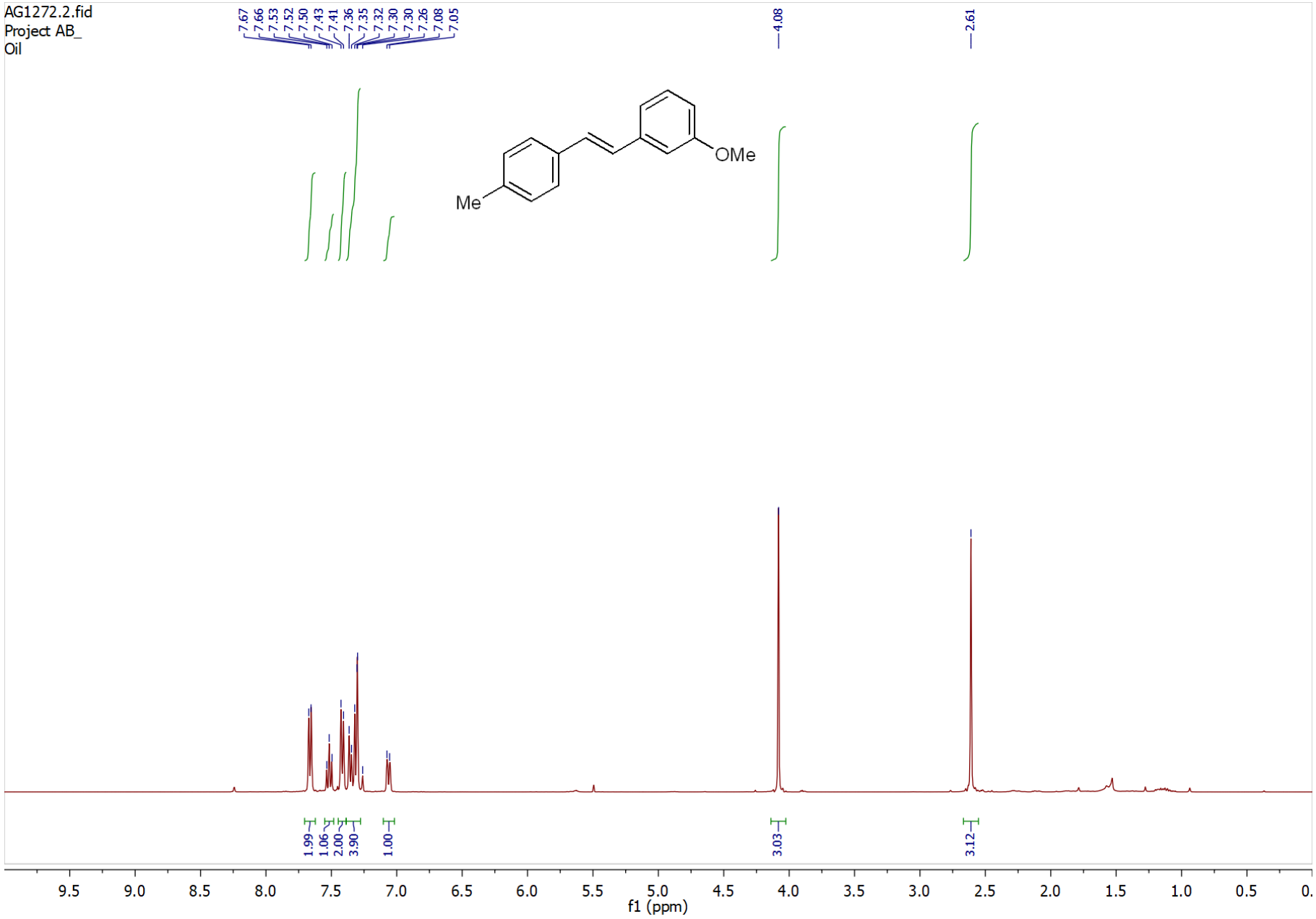
Compound 11l



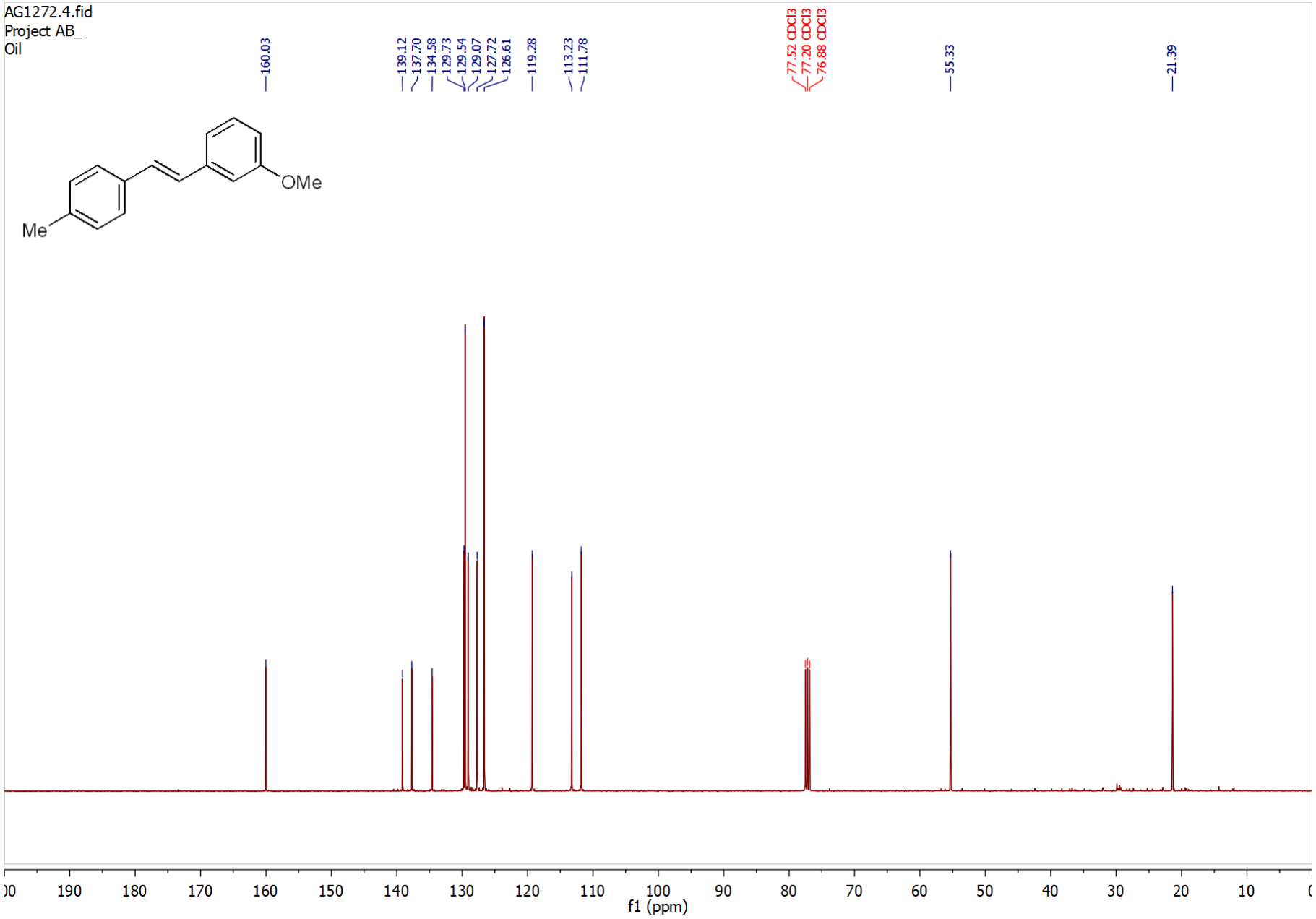
Compound 11l



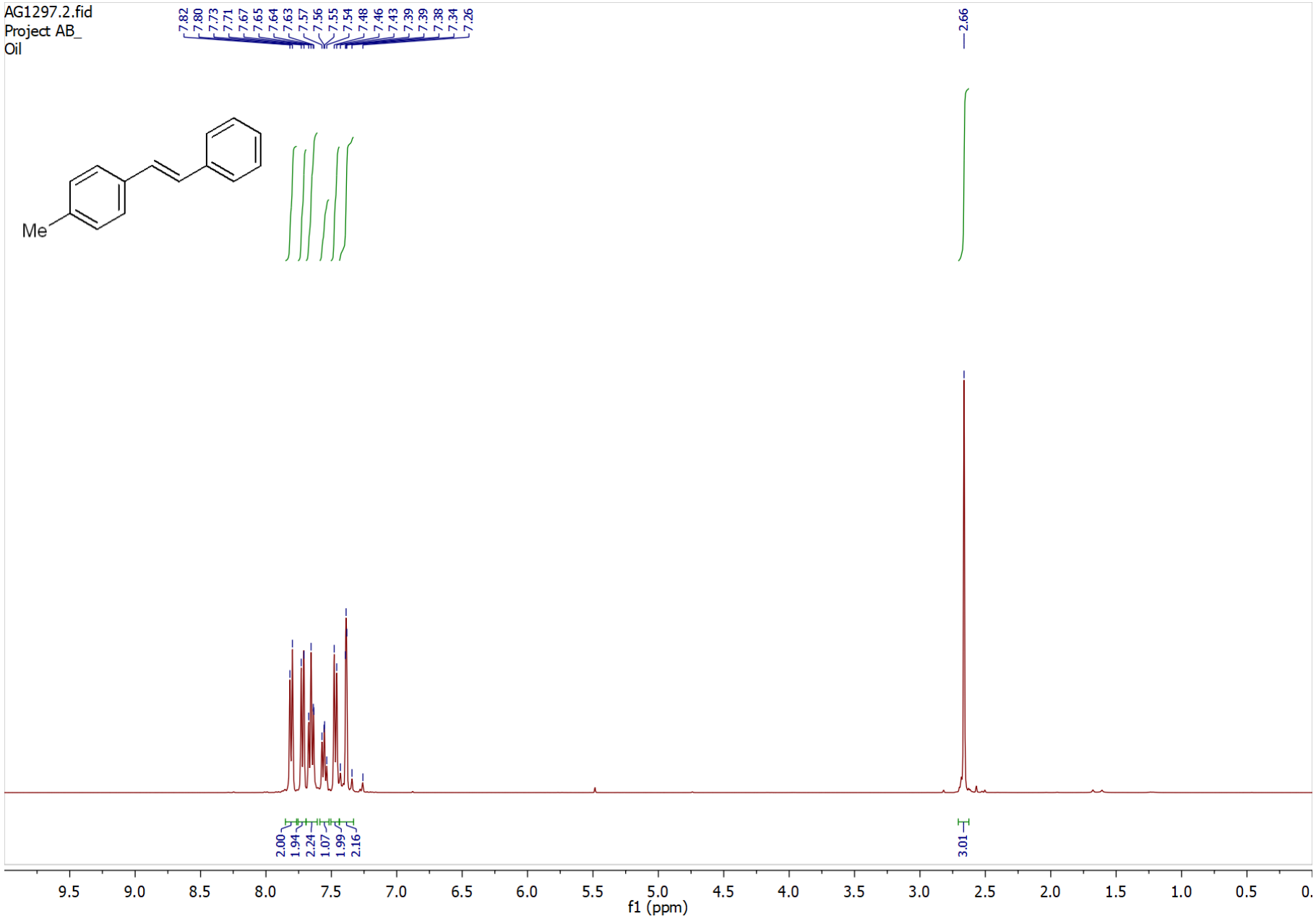
Compound 11m



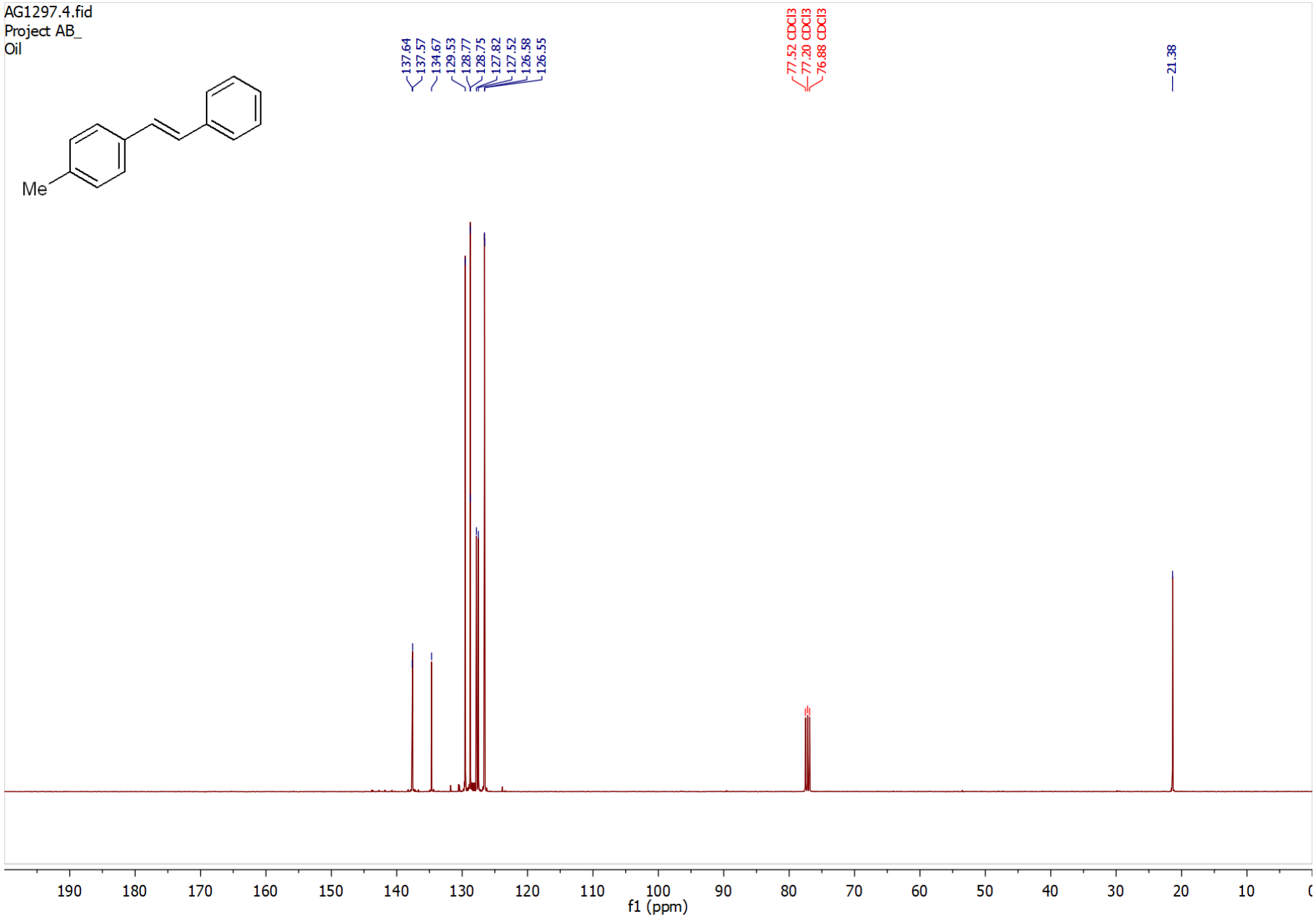
Compound 11m



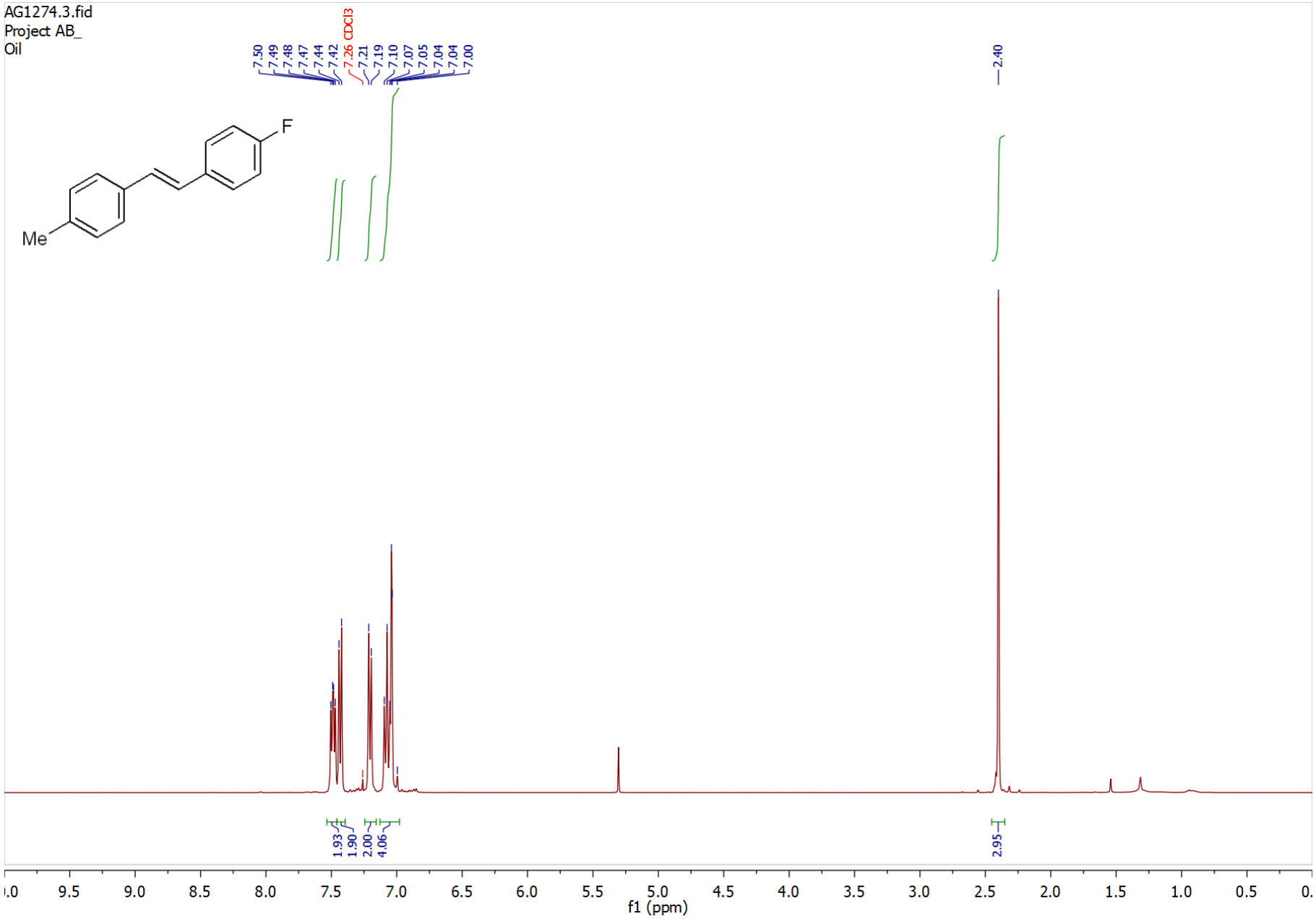
Compound 11n



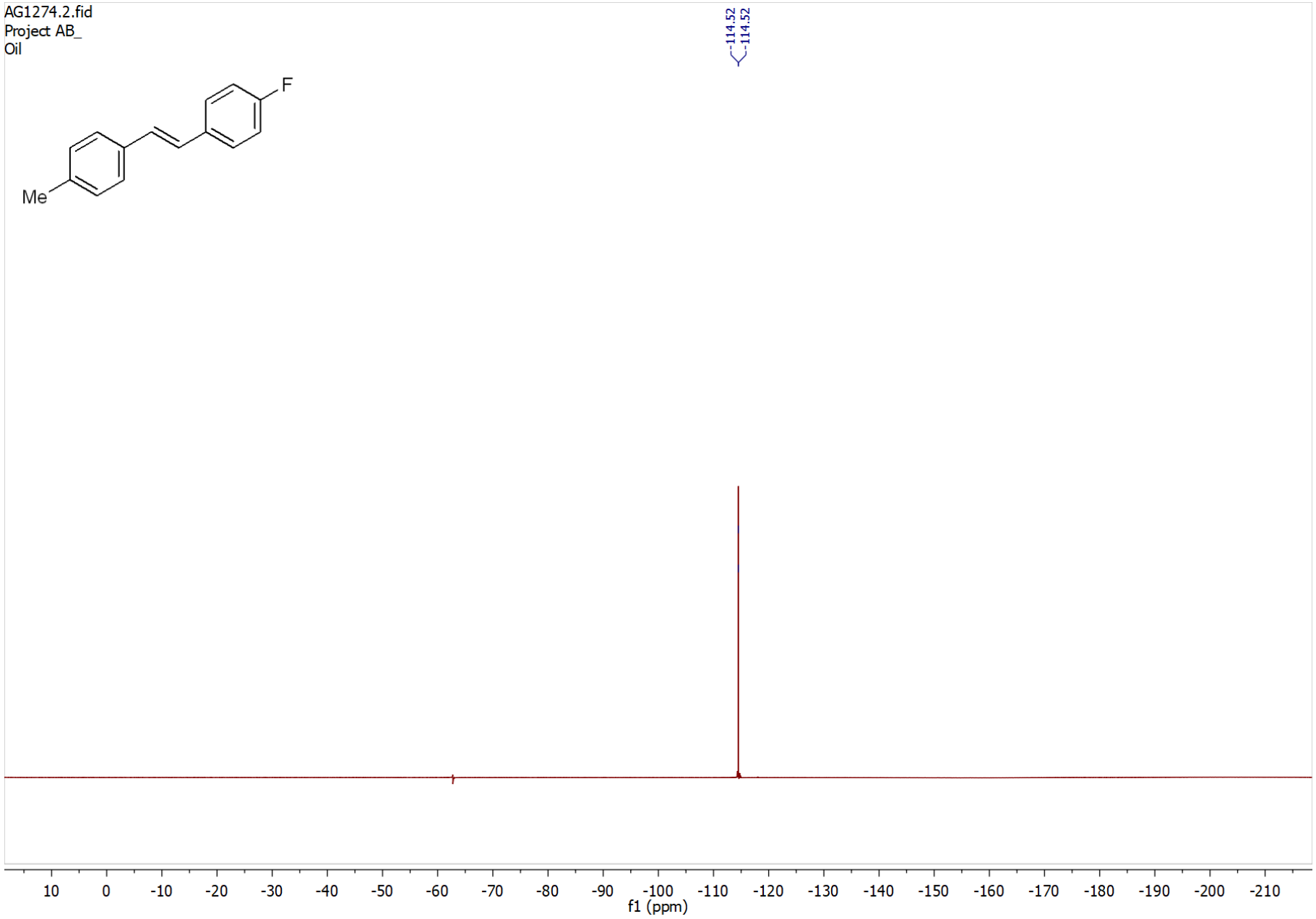
Compound 11n



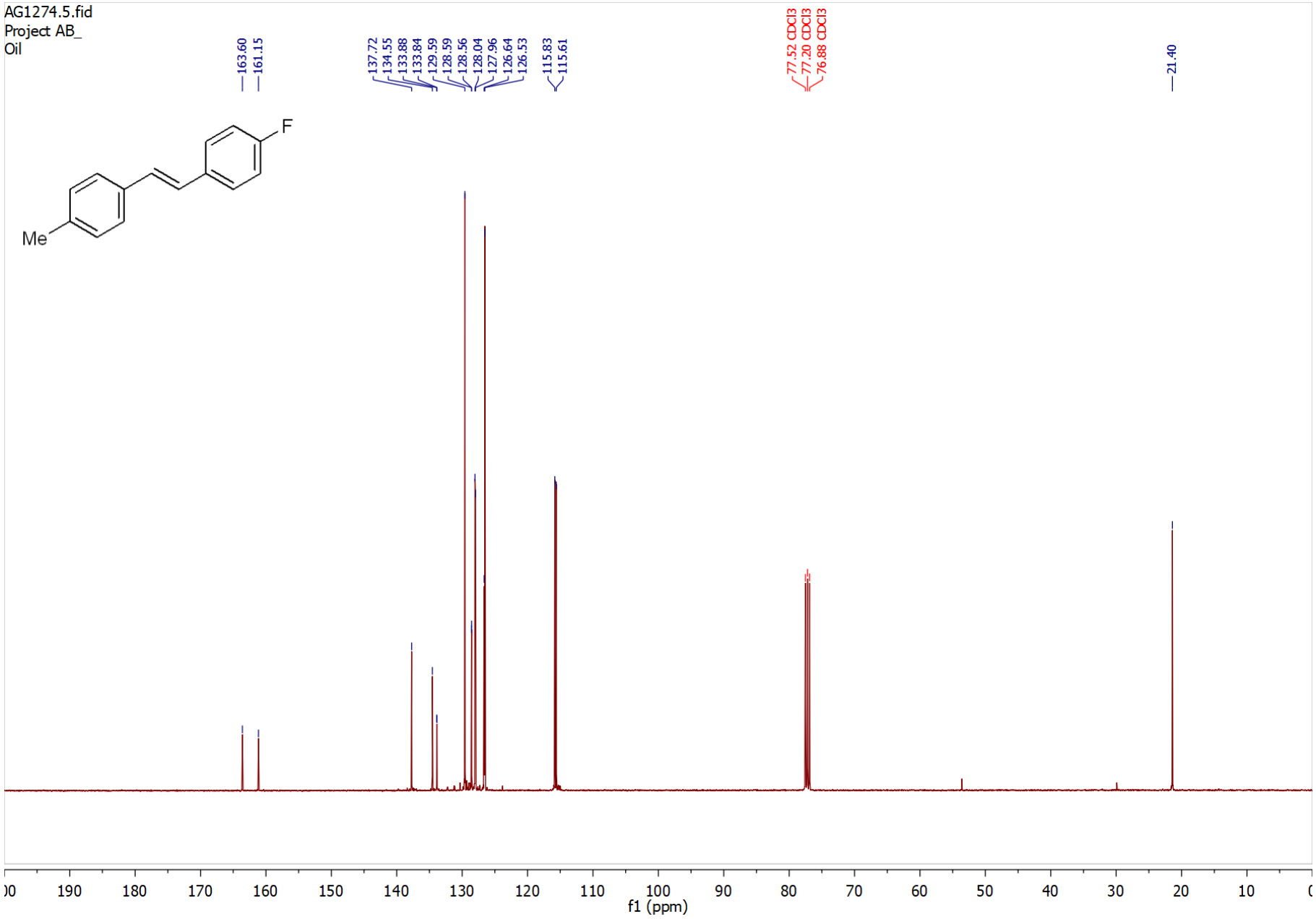
Compound 11o



Compound 11o



Compound 11o



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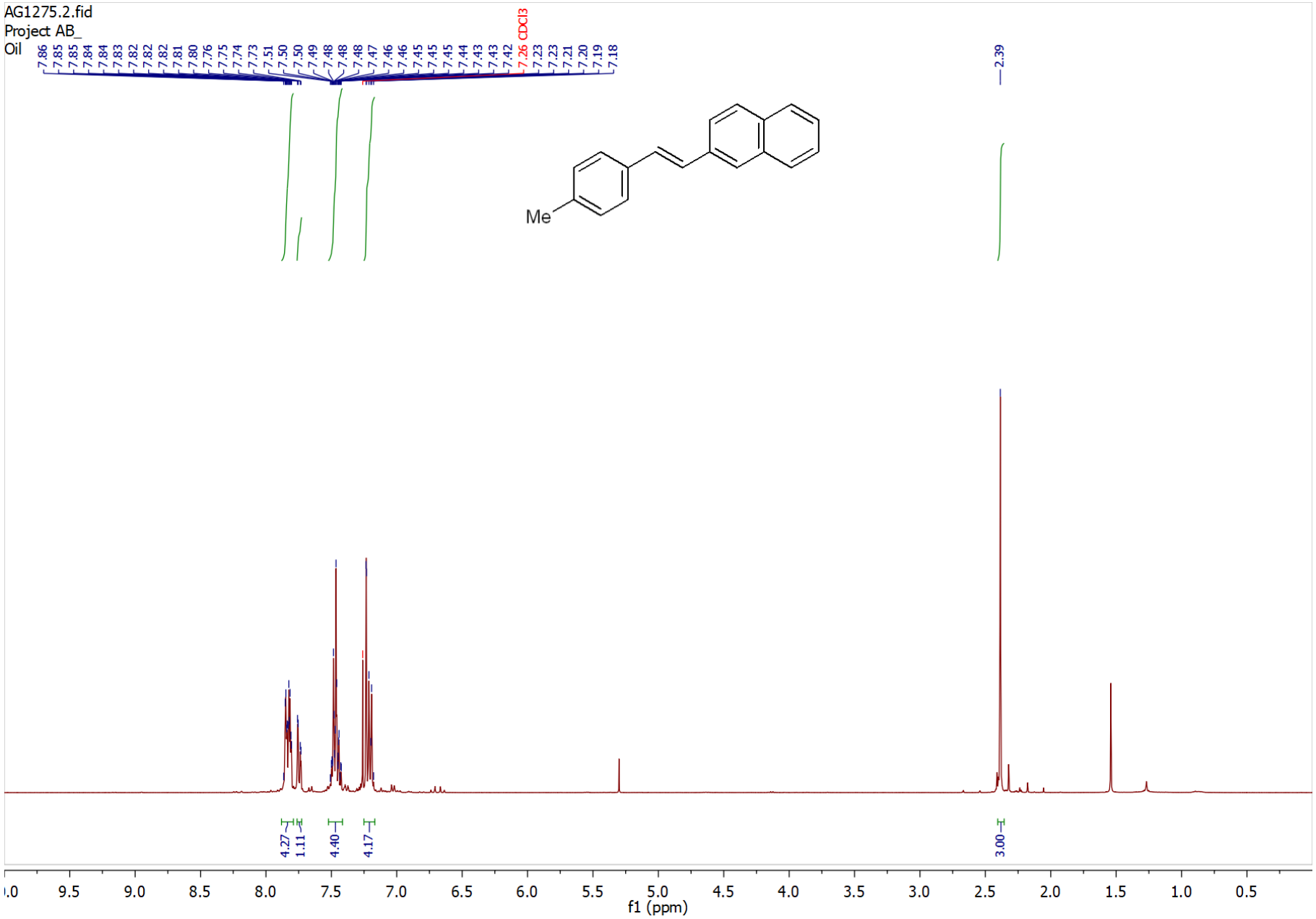

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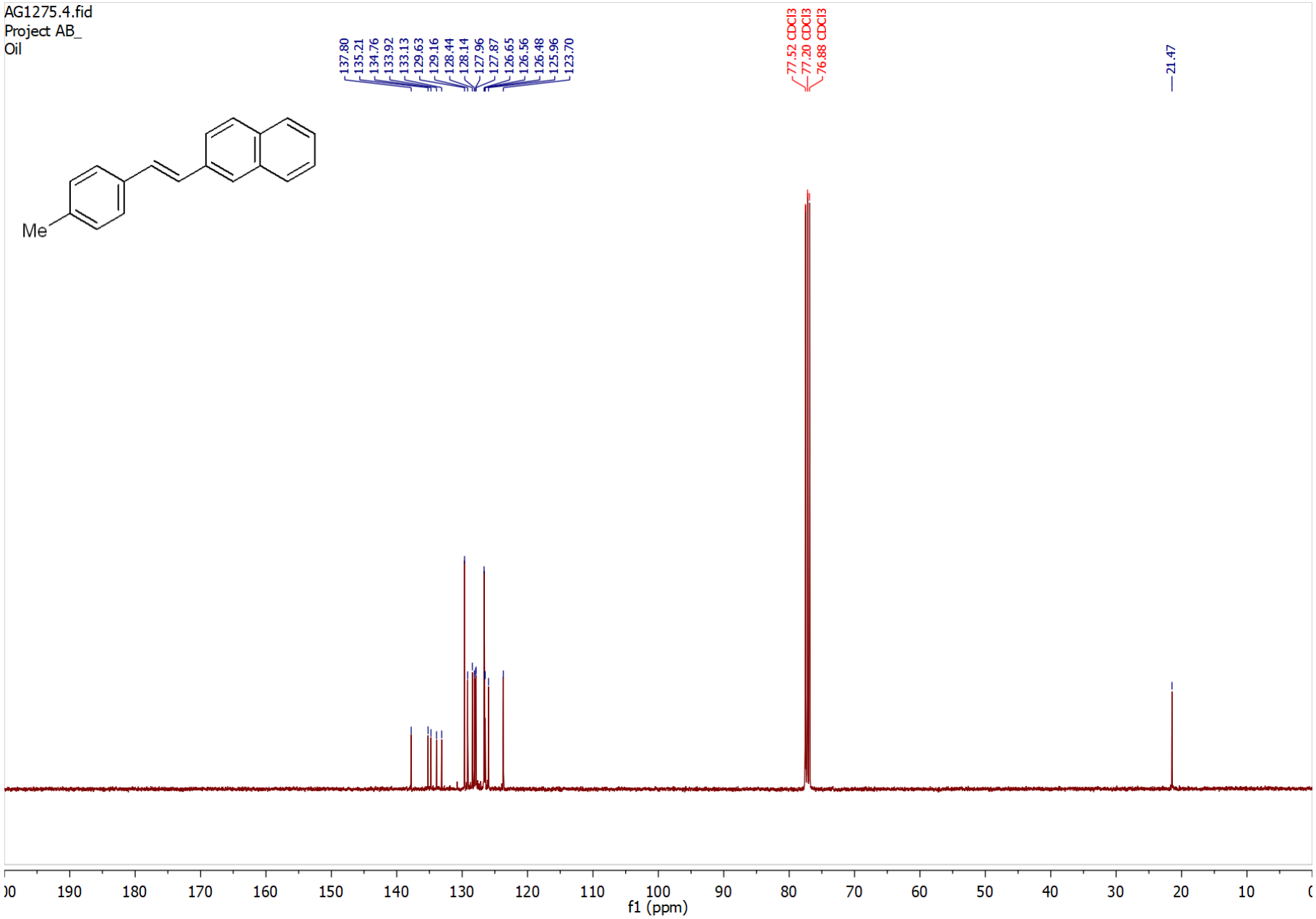
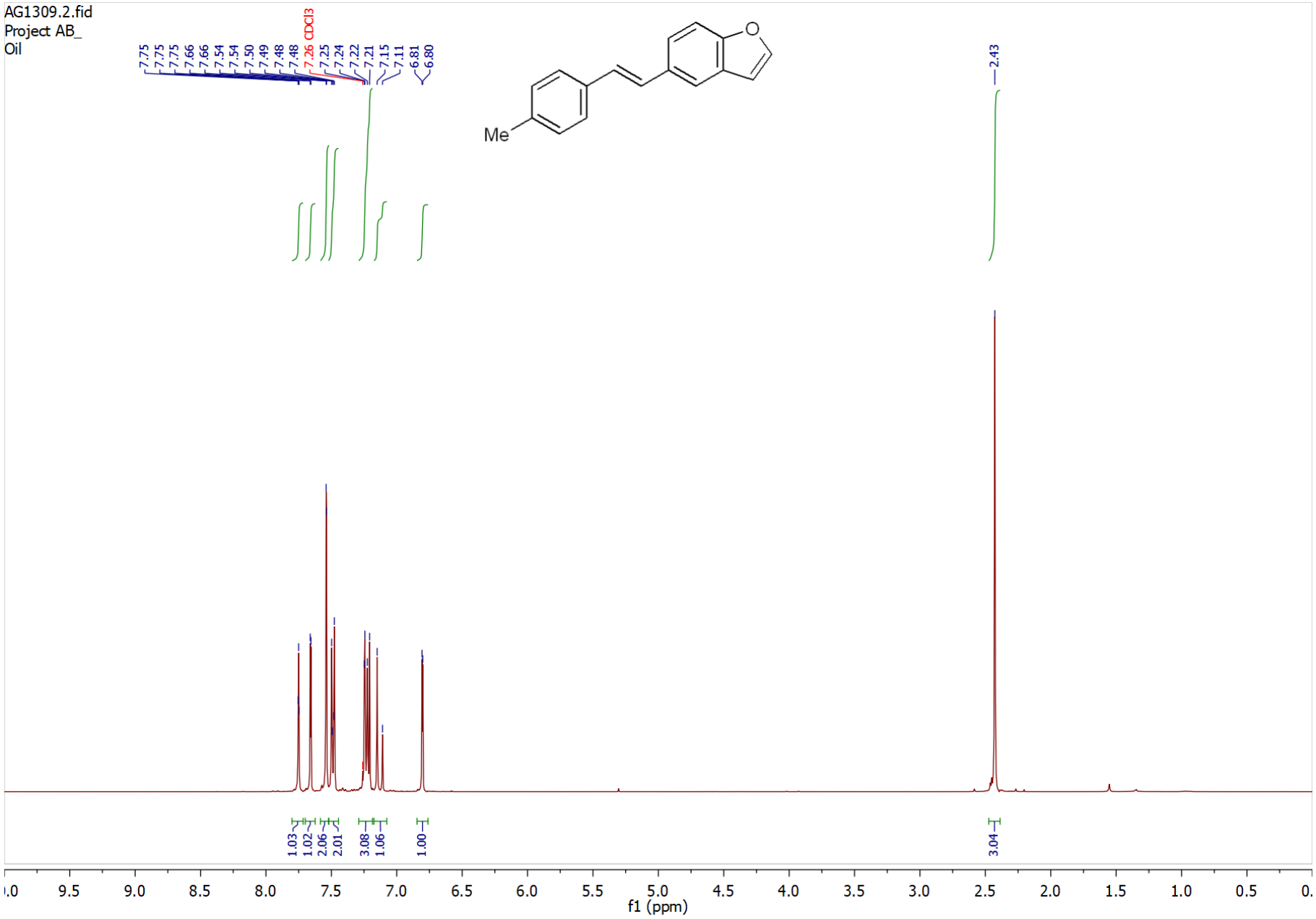


Compound 11q



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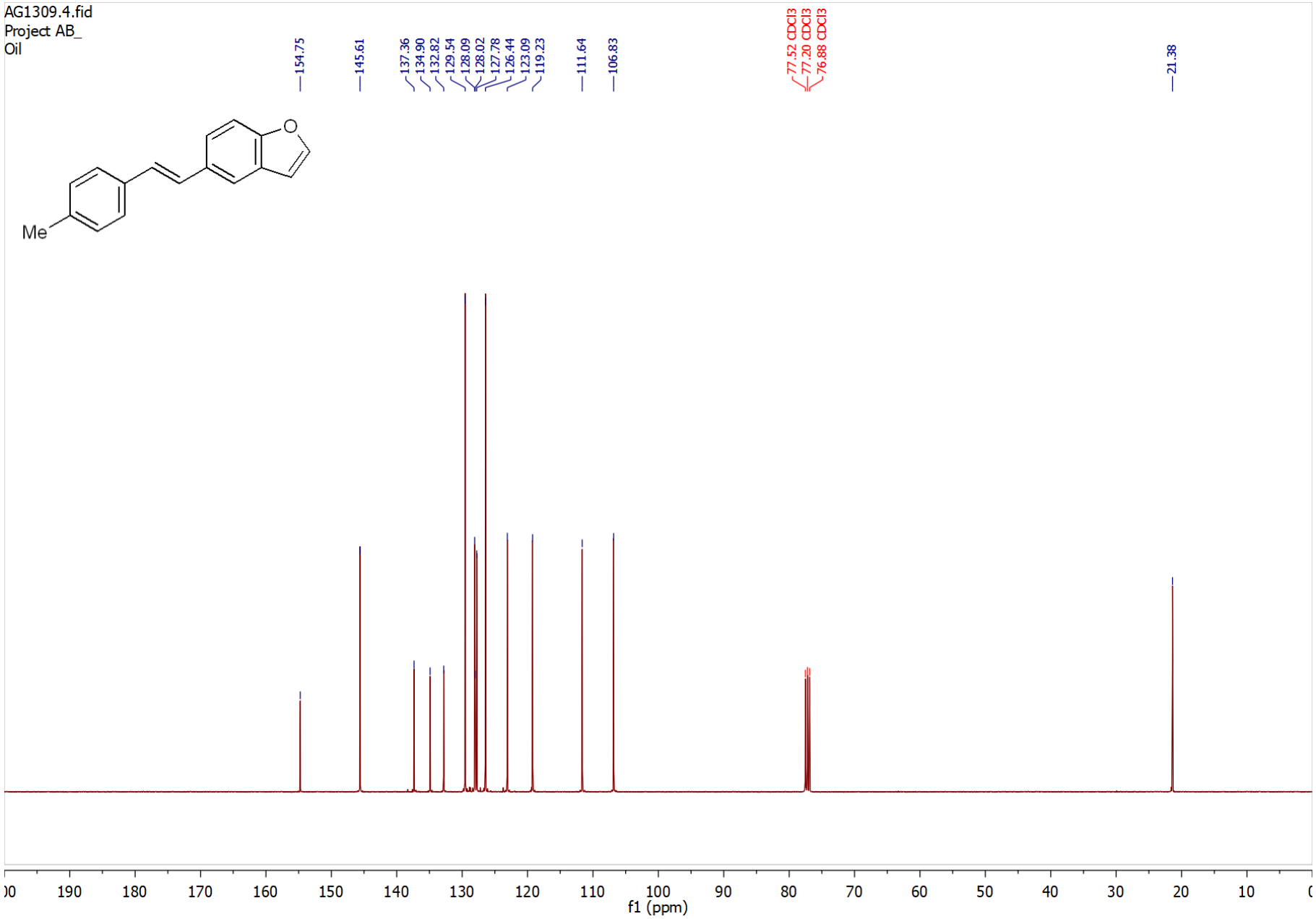

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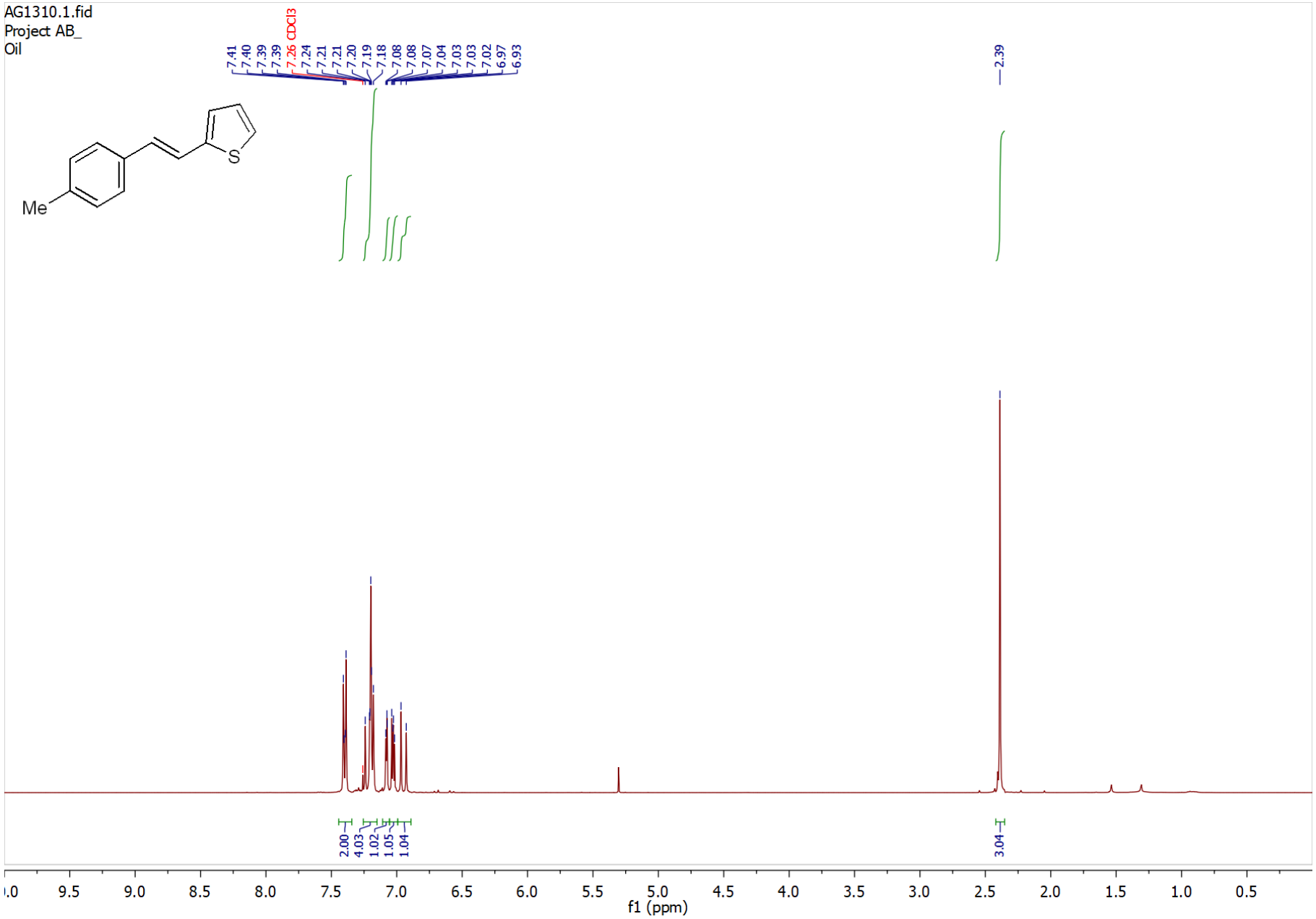

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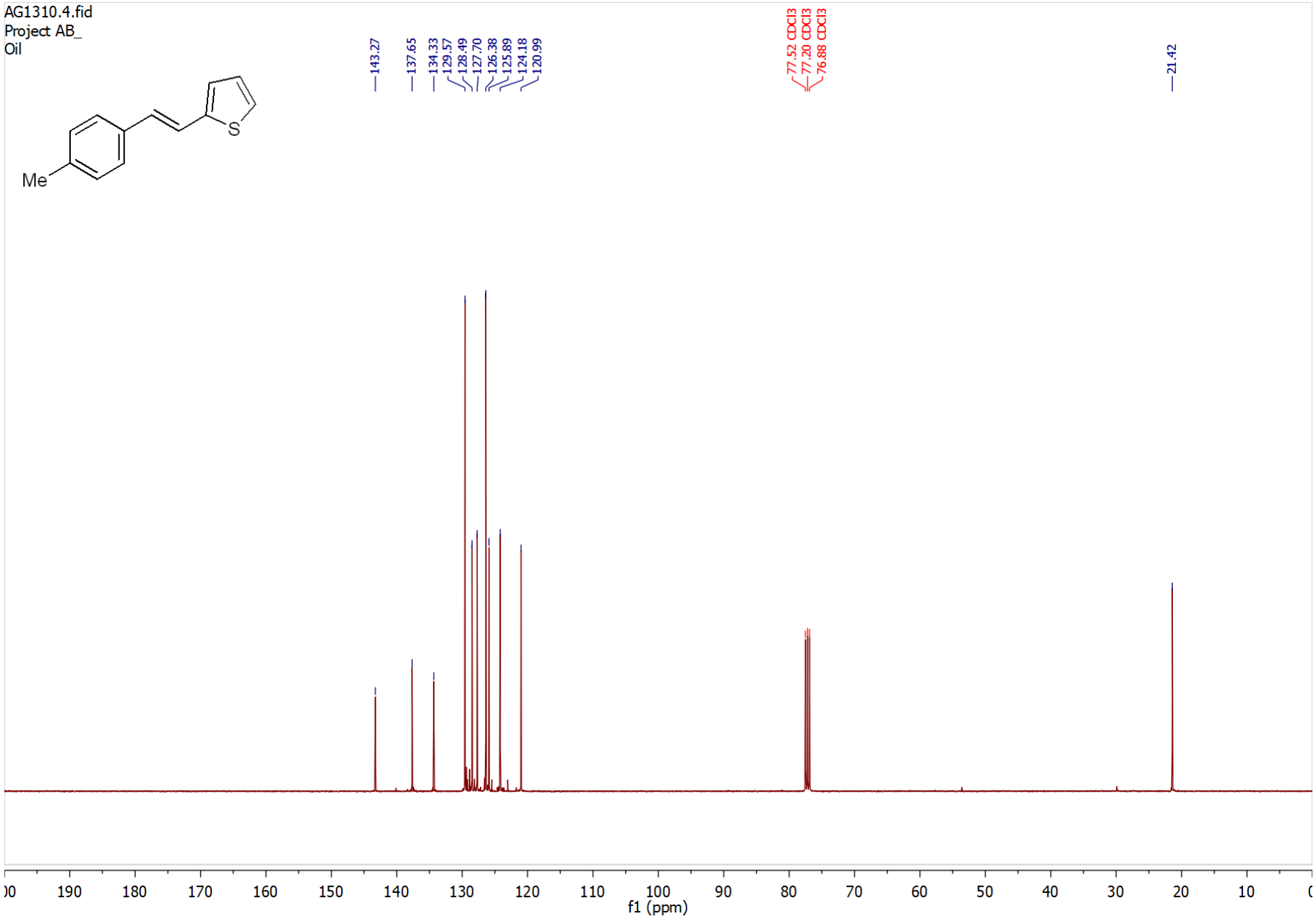
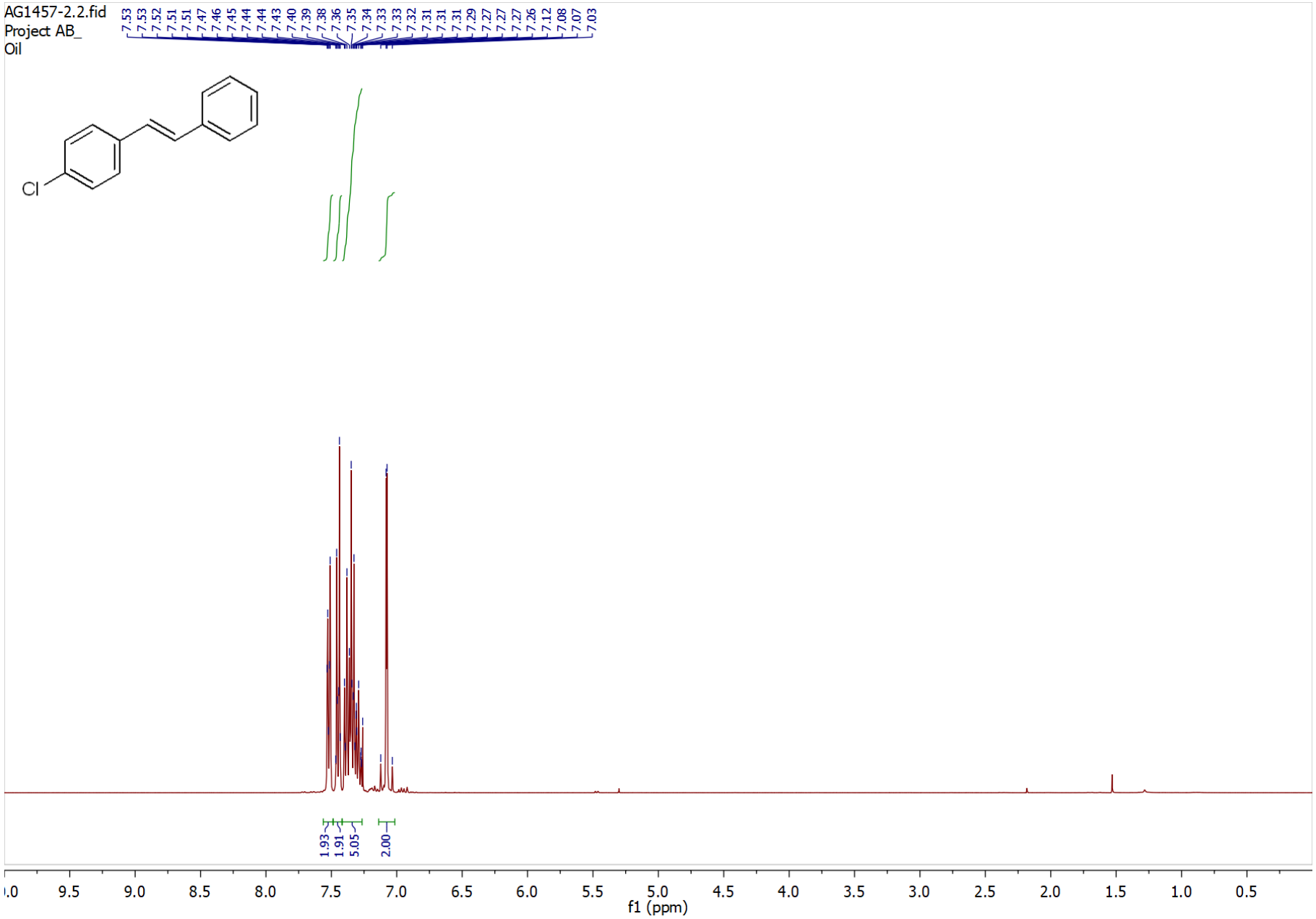


Compound 11s



Compound 11s