

SUPPORTING INFORMATION FOR

**Innovative Regioselective Synthesis of Dispiro[fluorene-
9,3'-pyrazole-5',4''-pyrazolidines]: Experimental and
Computational Study**

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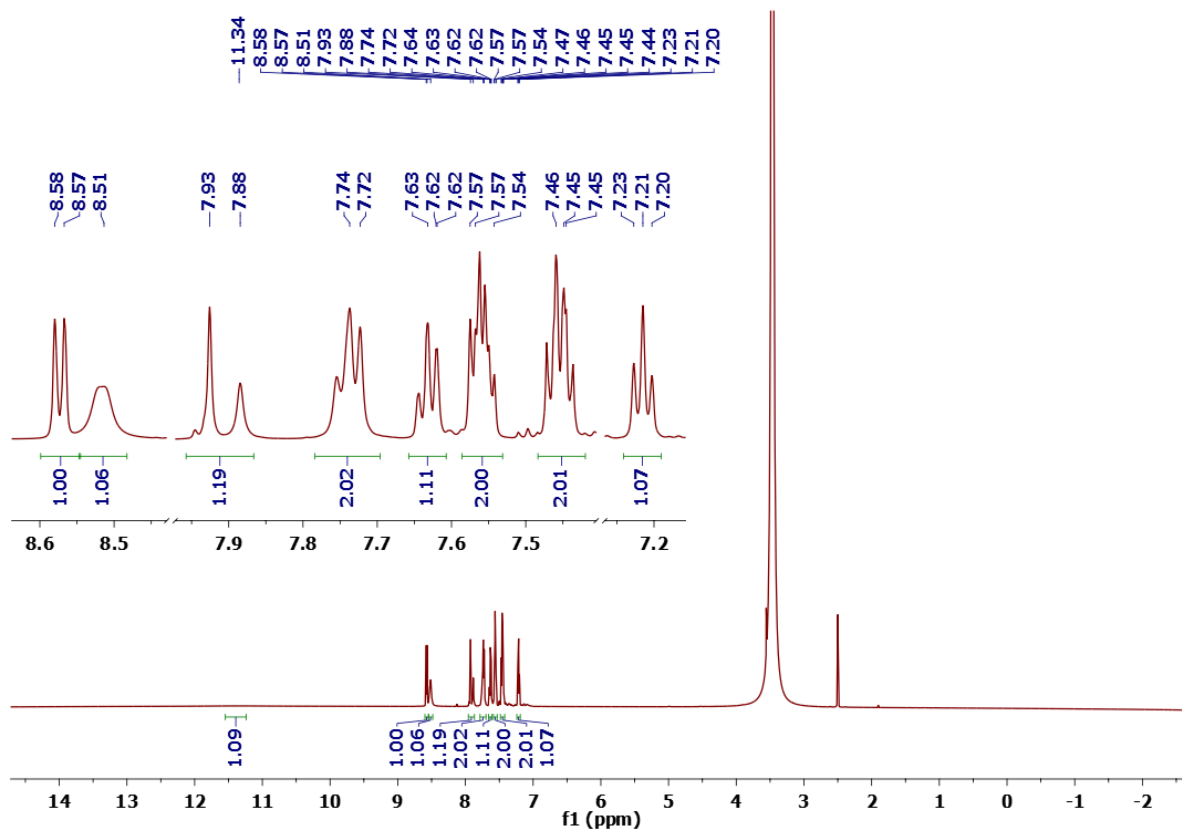
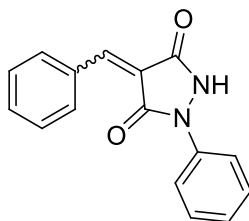
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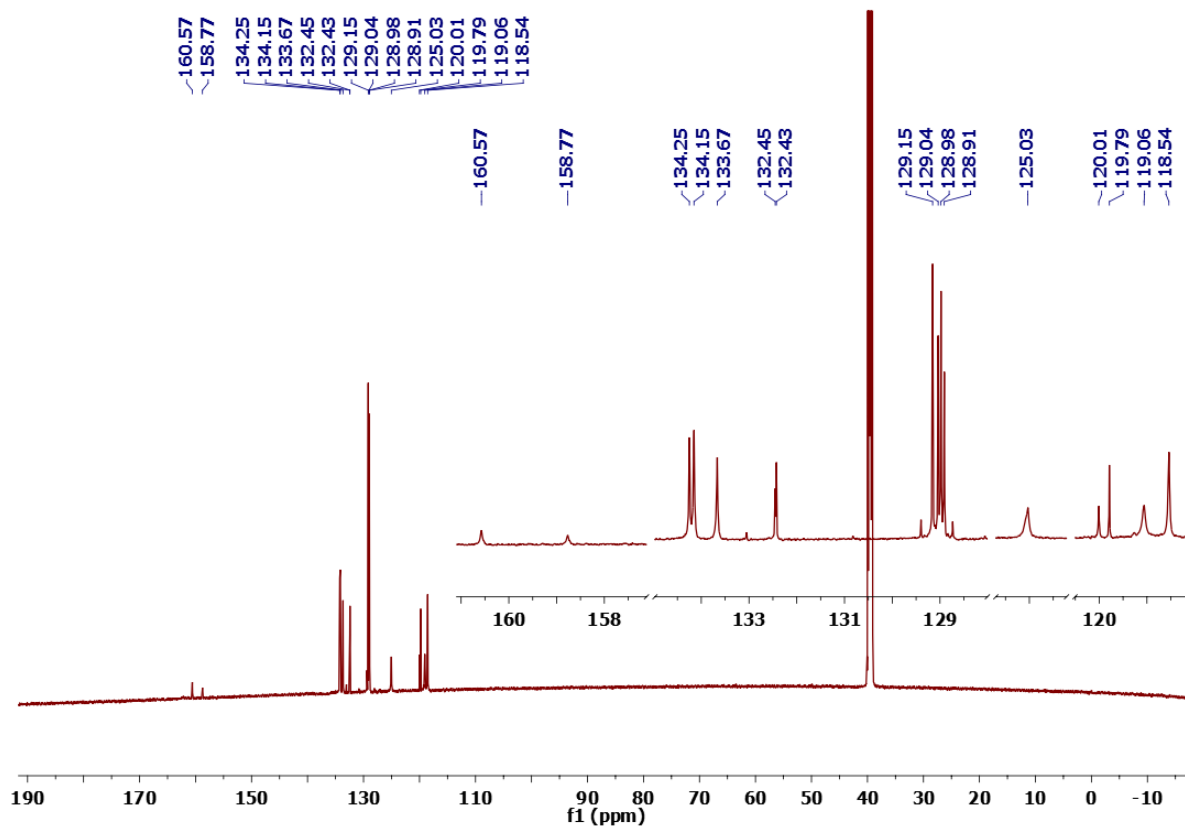
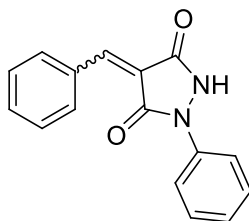
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(E)/(Z)-4-(4-benzylidene)-1-phenylpyrazolidine-3,5-dione (3a)	S3
(E)/(Z)-4-(4-methoxybenzylidene)-1-phenylpyrazolidine-3,5-dione (3b)	S6
(E)/(Z)-4-(4-methylbenzylidene)-1-phenylpyrazolidine-3,5-dione (3c)	S9
(E)/(Z)-4-(4-chlorobenzylidene)-1-phenylpyrazolidine-3,5-dione (3d)	S12
(E)/(Z)-4-(4-fluorobenzylidene)-1-phenylpyrazolidine-3,5-dione (3e)	S15
(E)/(Z)-4-(4-cyanobenzylidene)-1-phenylpyrazolidine-3,5-dione (3f)	S19
(E)/(Z)-4-(4-nitrobenzylidene)-1-phenylpyrazolidine-3,5-dione (3g)	S22
(4'R,5'R)-1'',4'-diphenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5a) and (4'S,5'R)-1'',4'-diphenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'a)	S25
(4'R,5'R)-1''-phenyl-4'-(p-tolyl)-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5c) and (4'S,5'R)-1''-phenyl-4'-(p-tolyl)-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'c)	S31
(4'R,5'R)-1''-phenyl-4'-(p-tolyl)-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5c) and (4'S,5'R)-1''-phenyl-4'-(p-tolyl)-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'c)	S33
((4'R,5'R)-4'-(4-chlorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5d) and (4'S,5'R)-4'-(4-chlorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'd)	S39
(4'R,5'R)-4'-(4-fluorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5e) and (4'S,5'R)-4'-(4-fluorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'e)	S46
(4'R,5'R)-4'-(4-cyanophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5f) and (4'S,5'R)-4'-(4-cyanophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'f)	S52
(4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)	S58

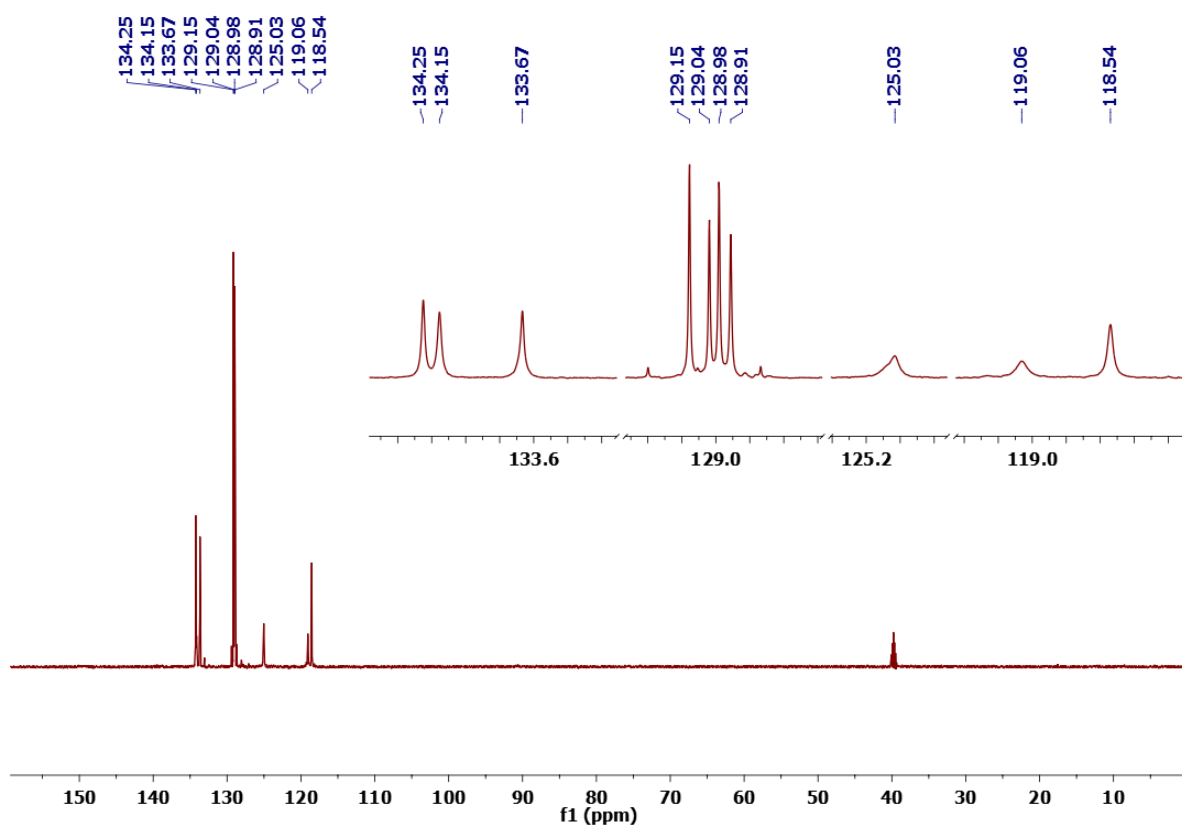
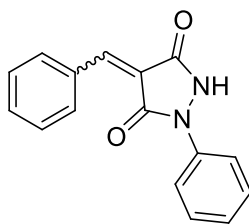
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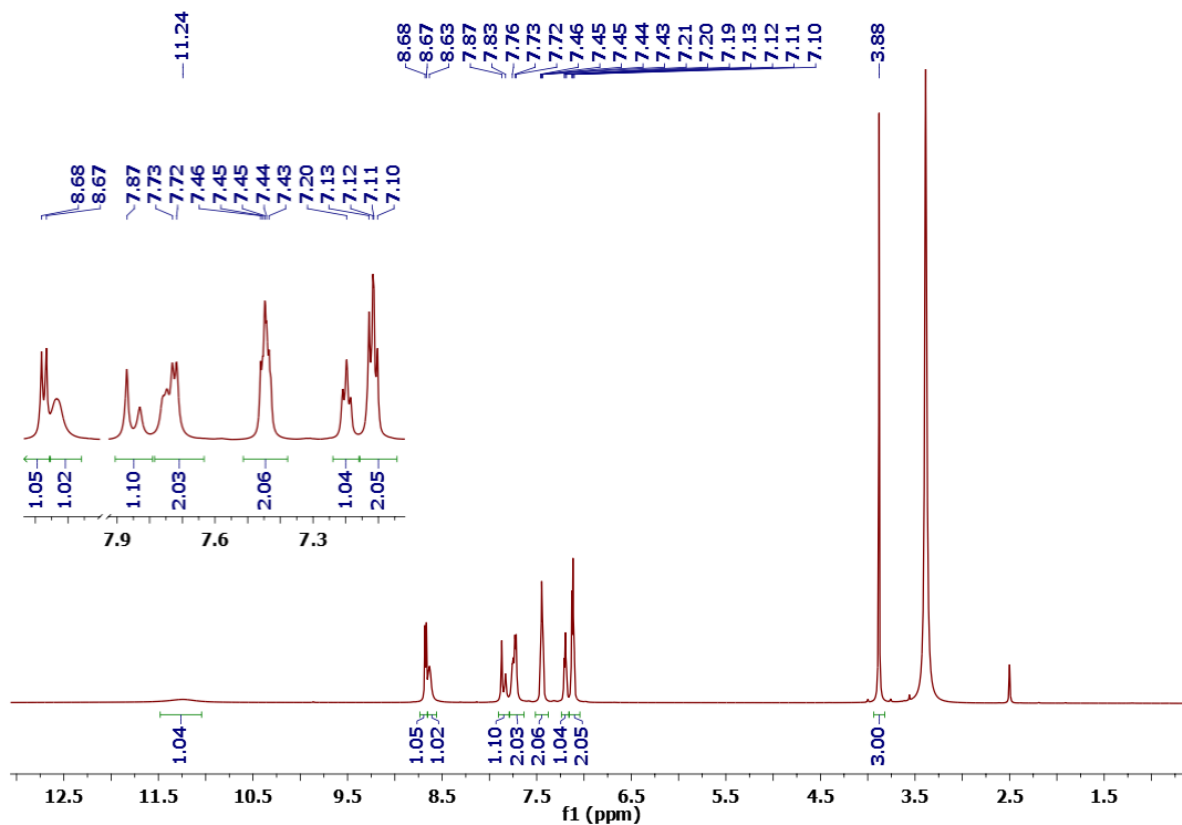
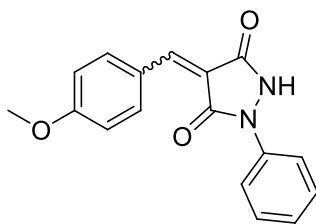
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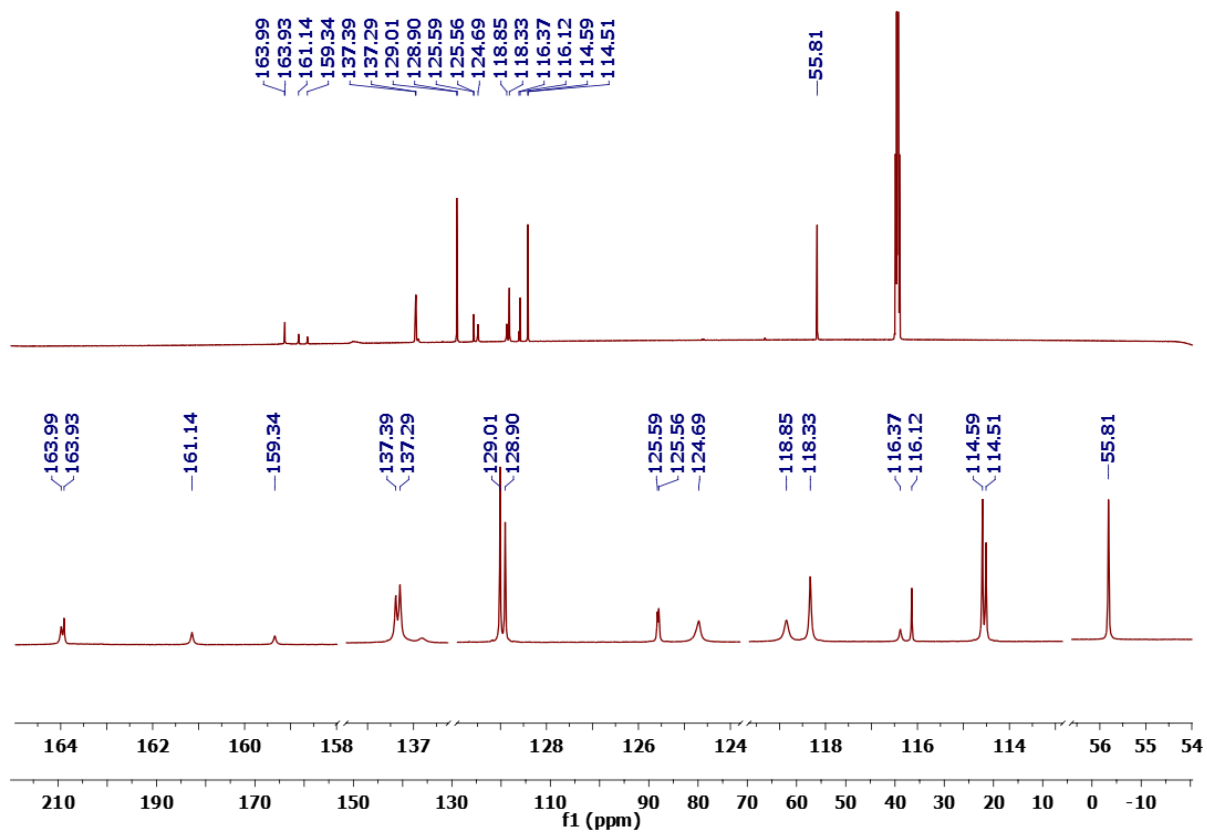
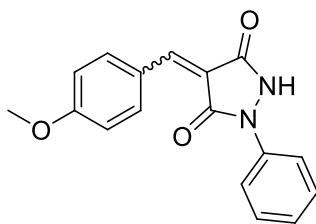
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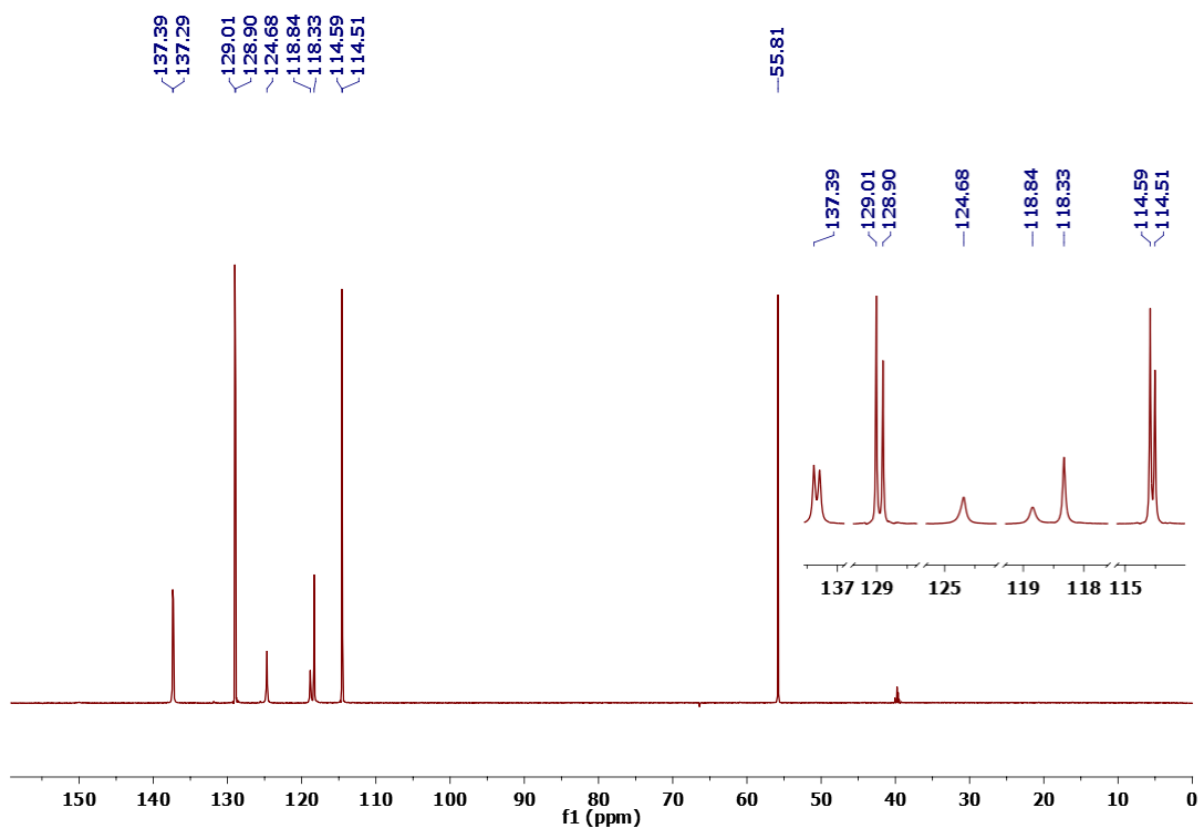
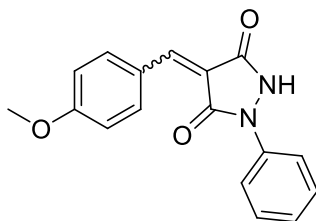
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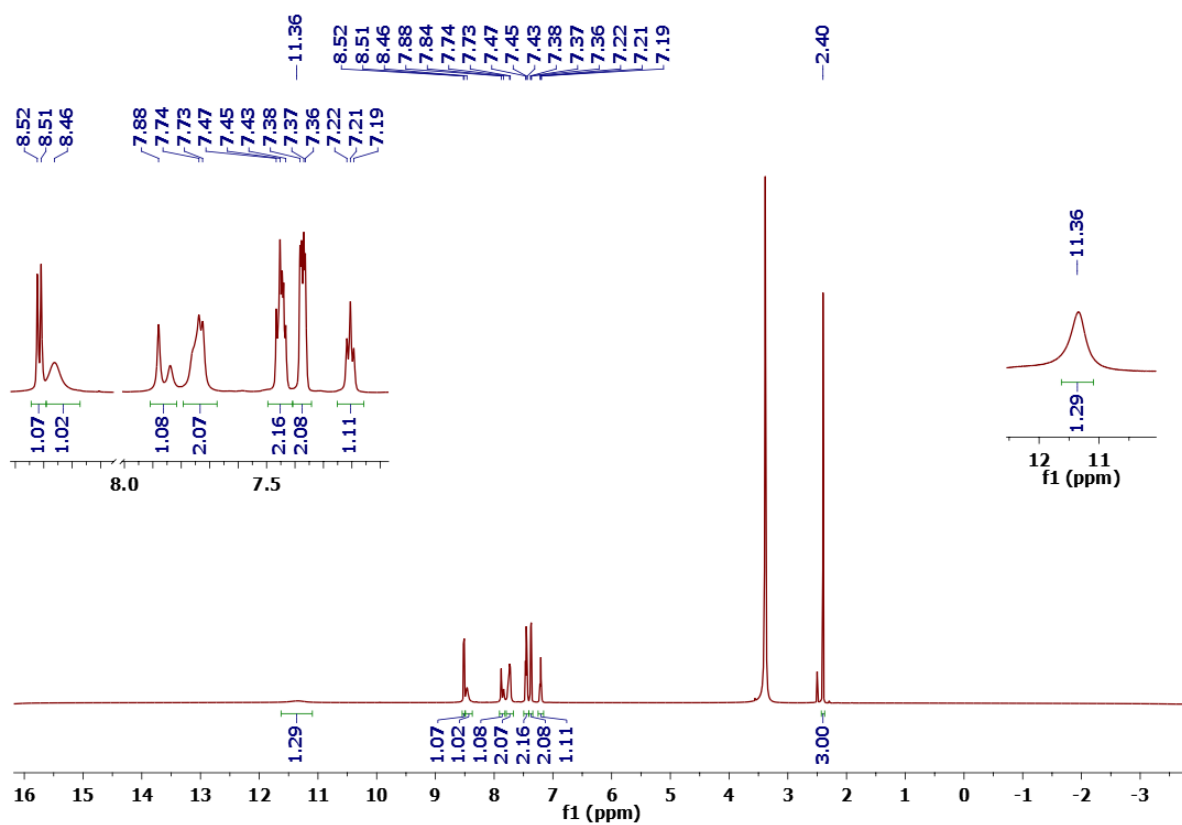
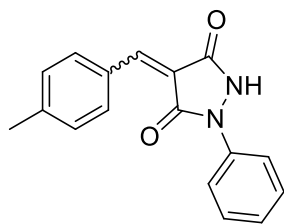
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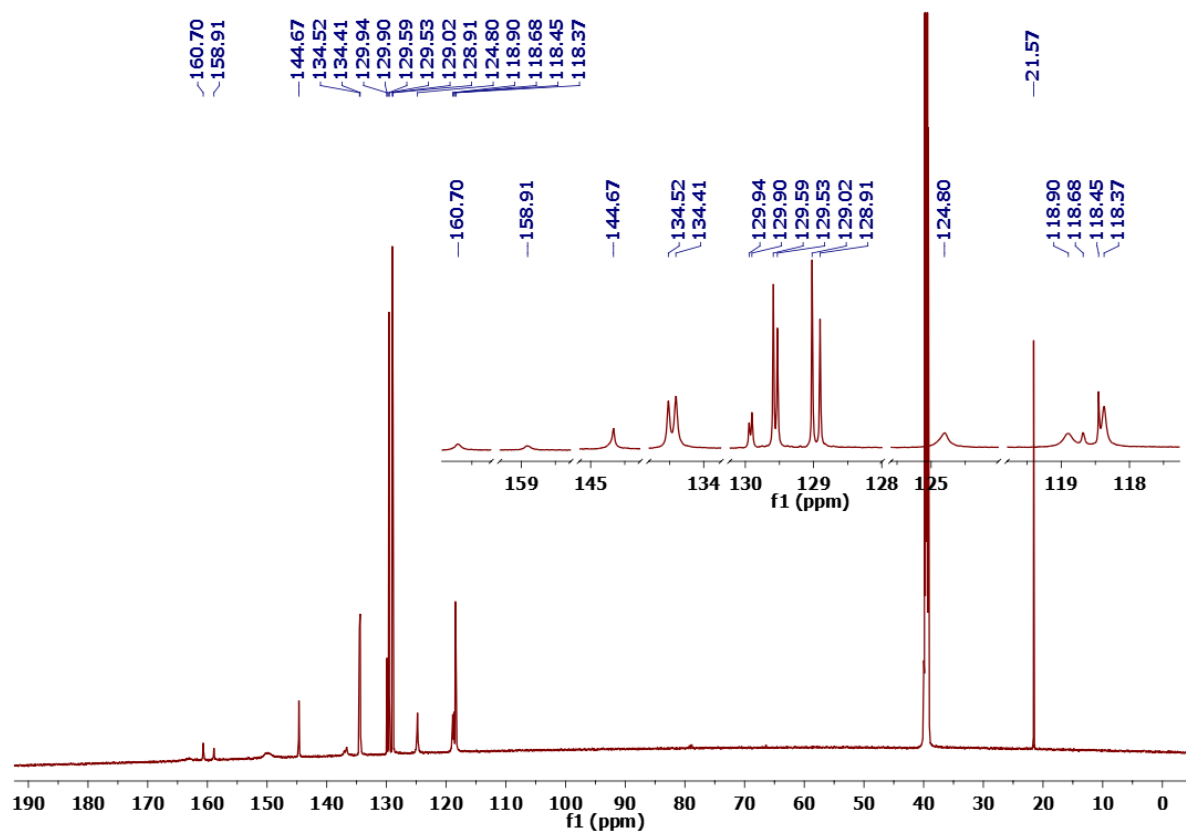
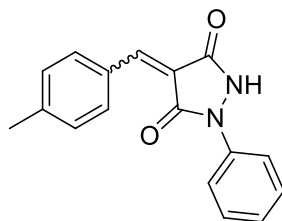
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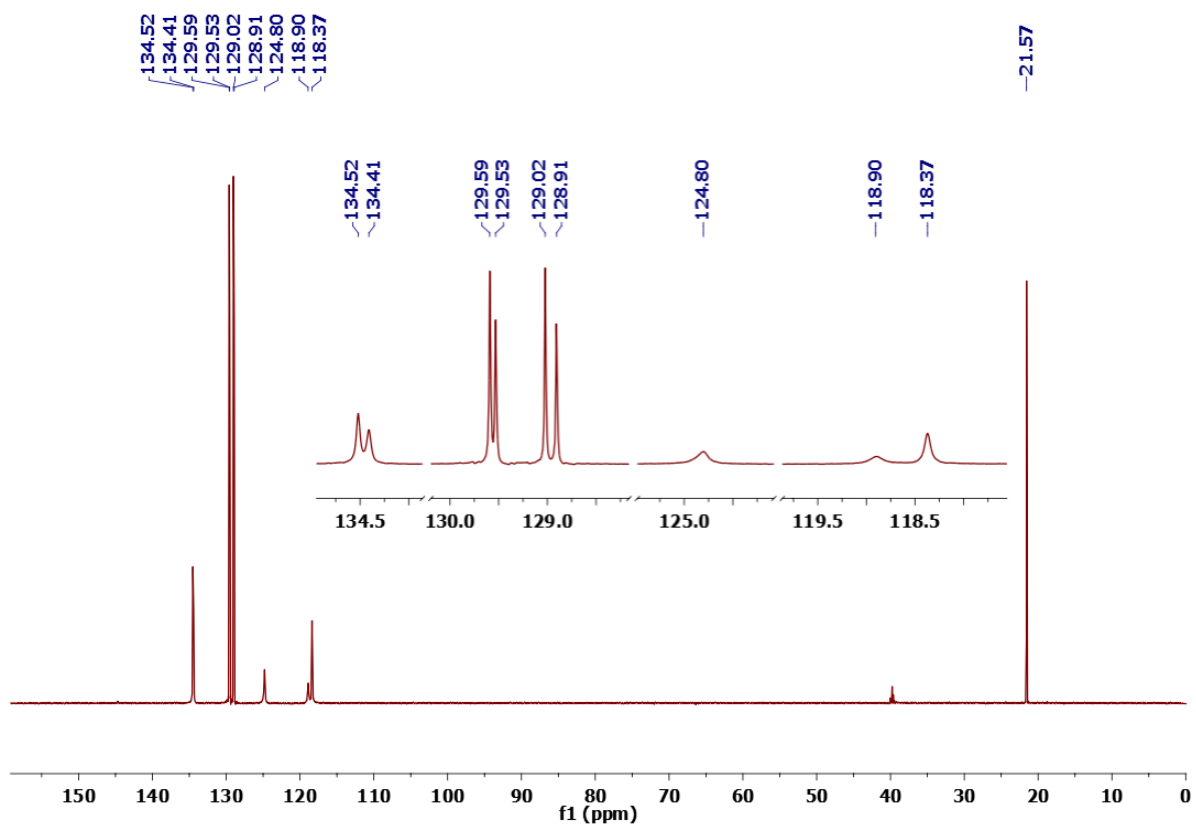
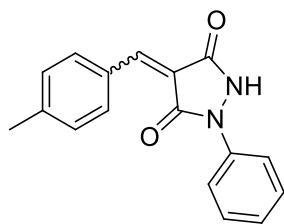
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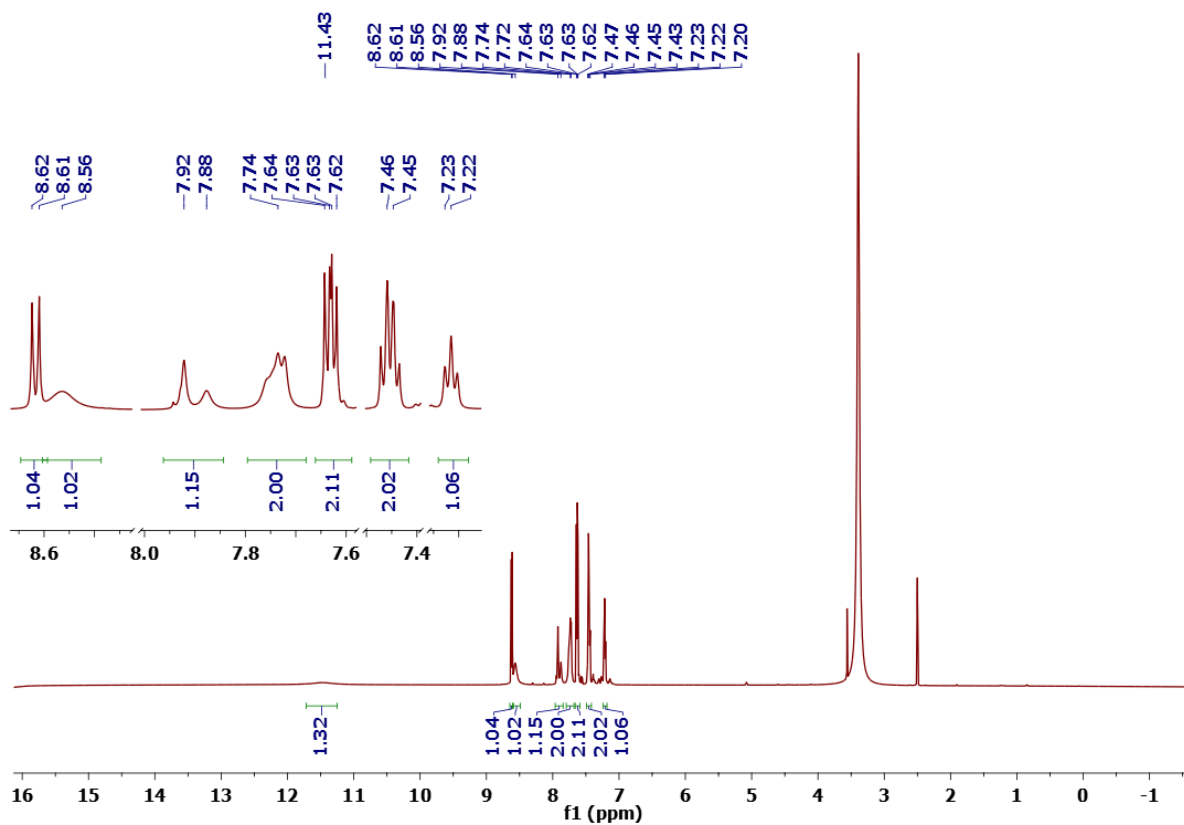
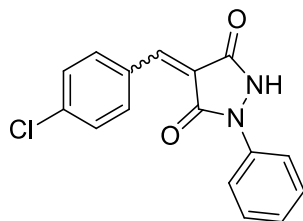
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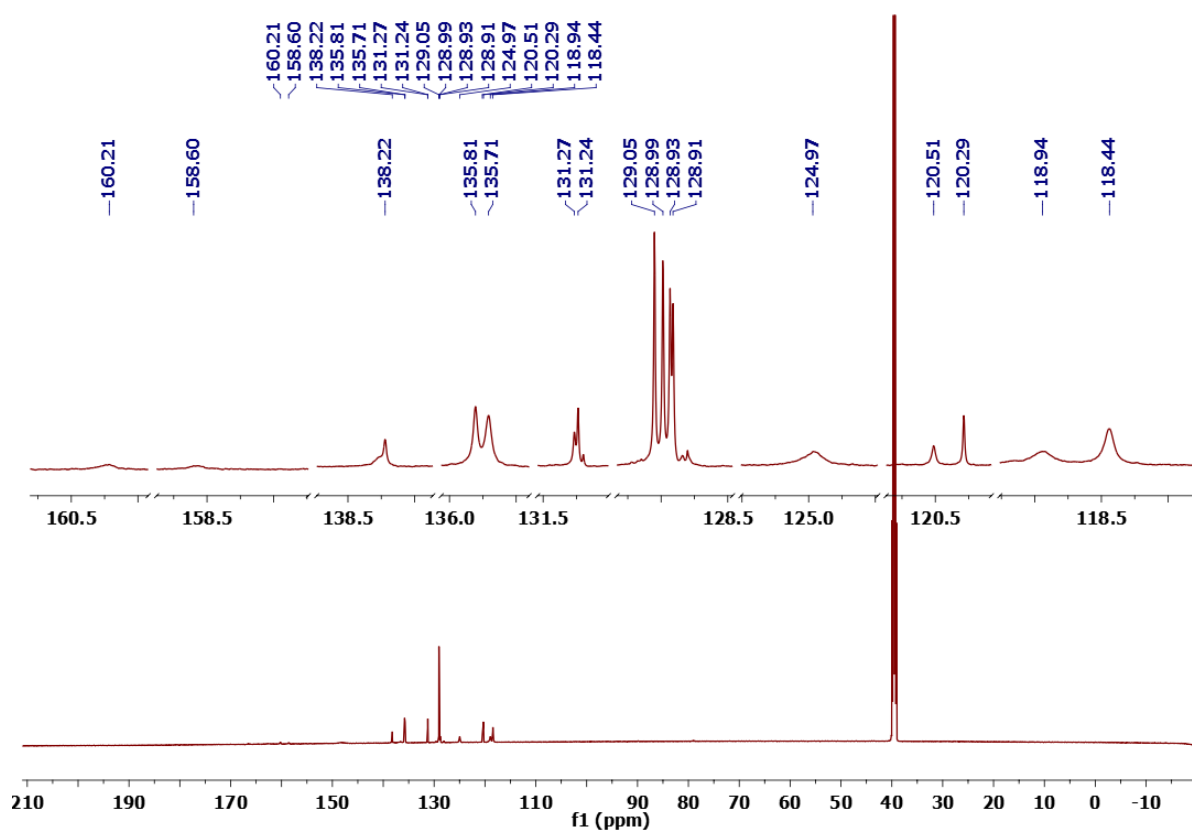
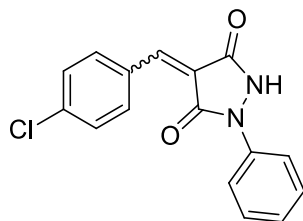
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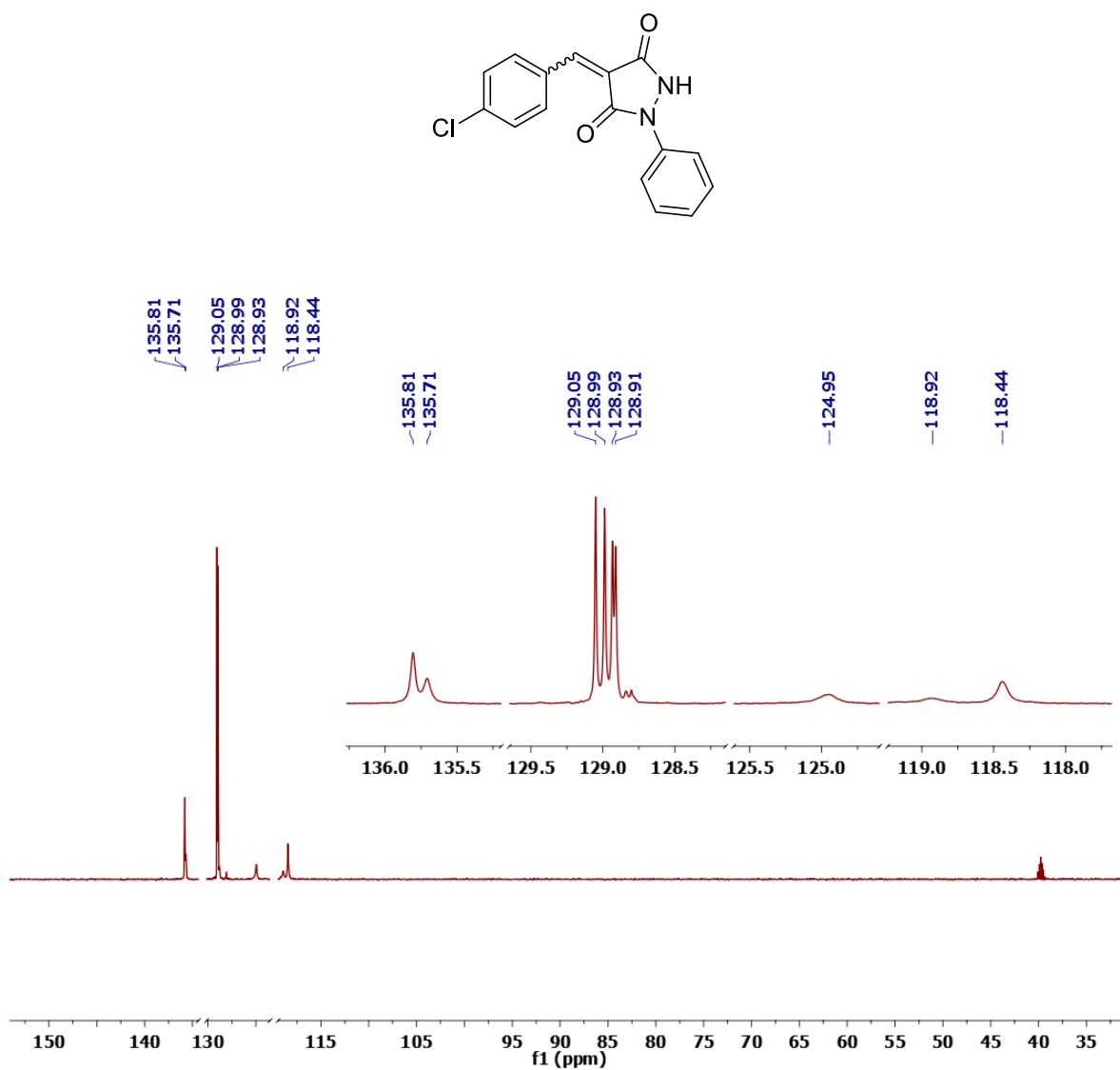
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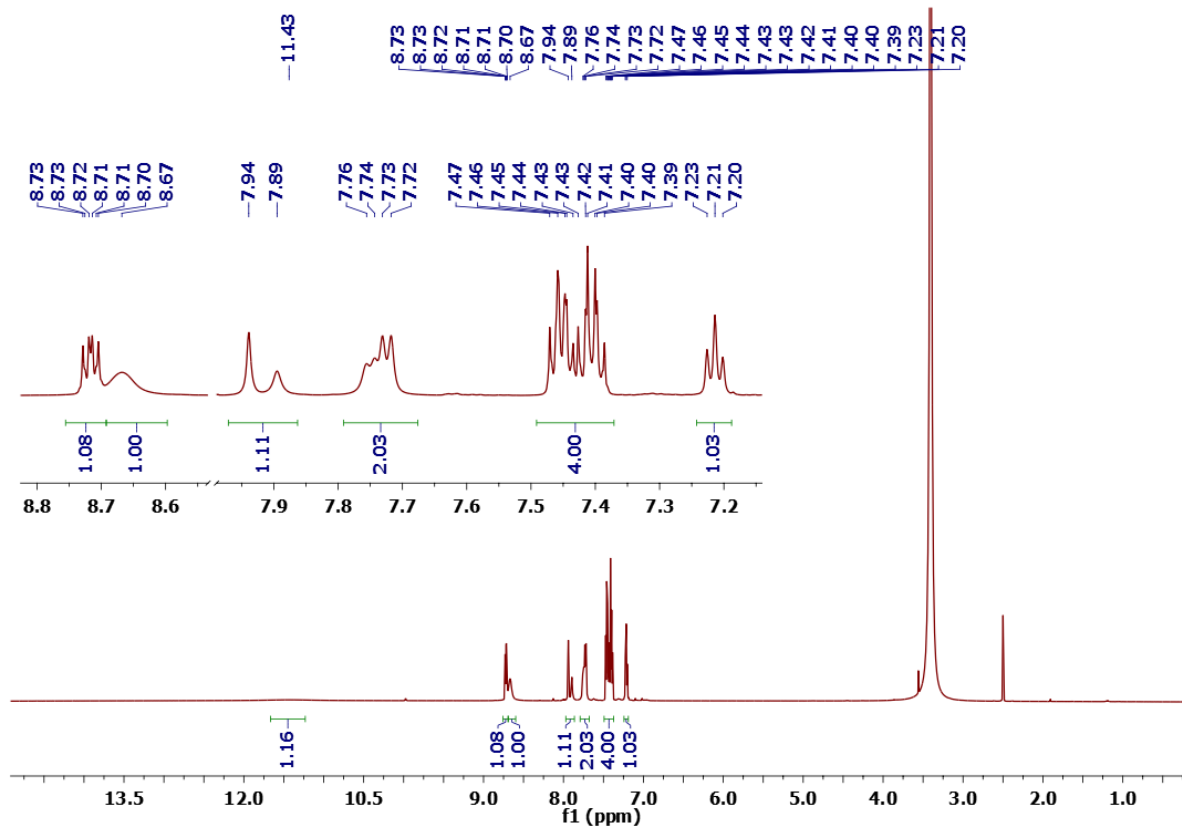
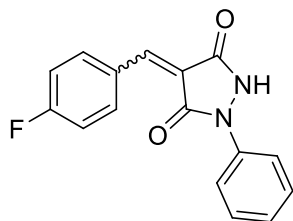
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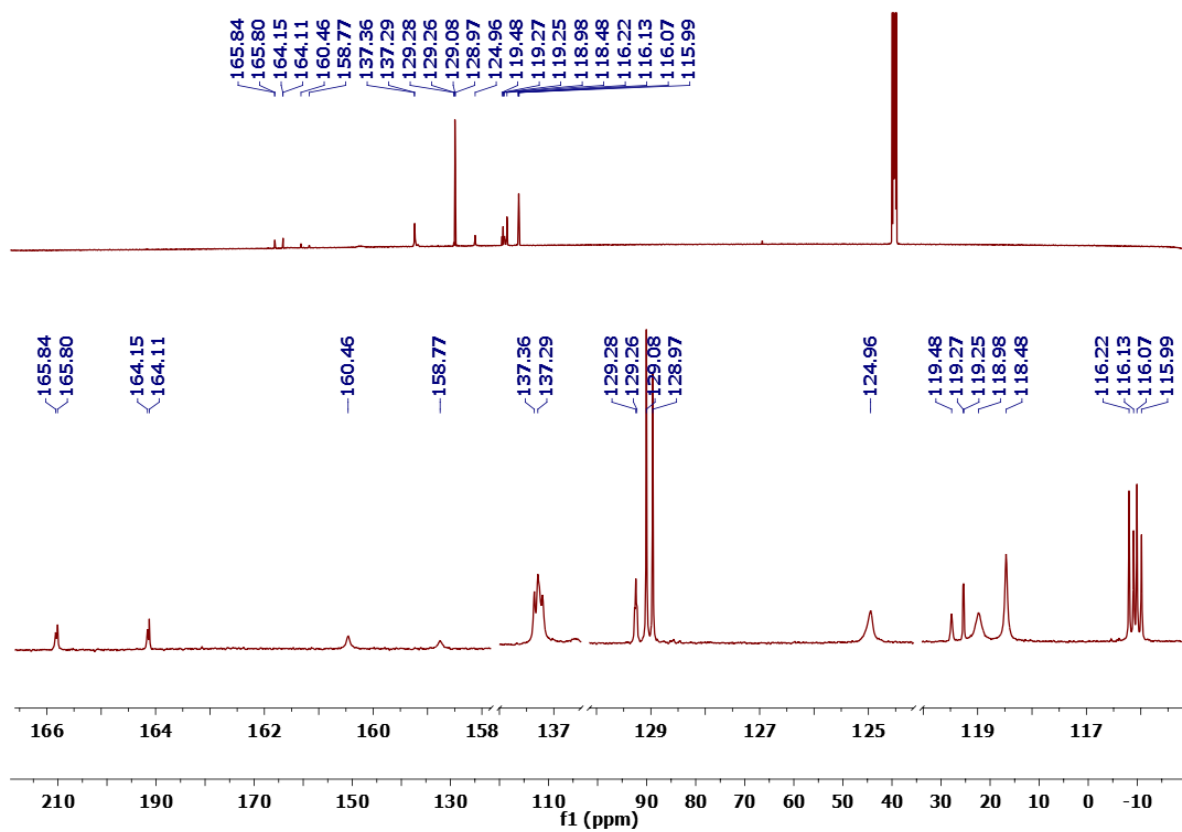
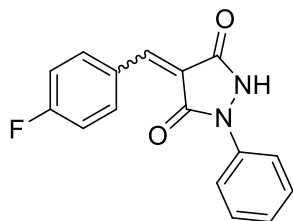
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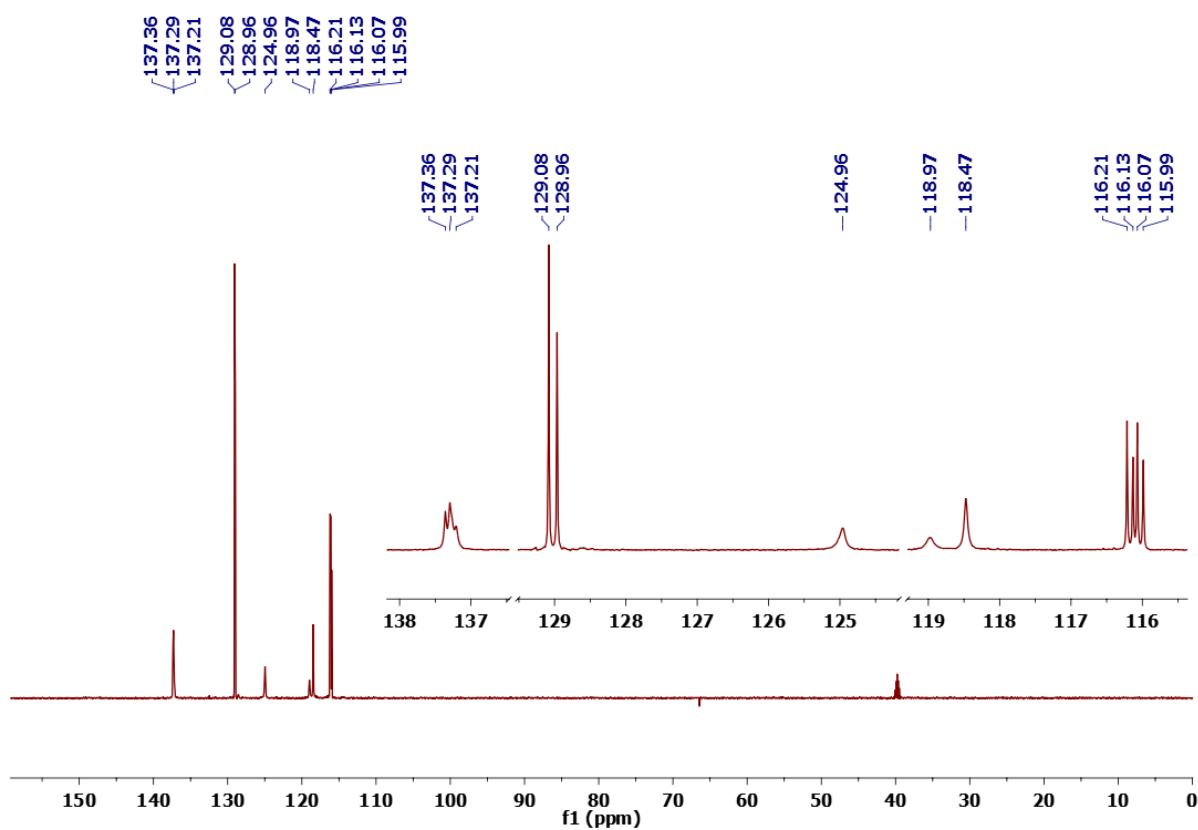
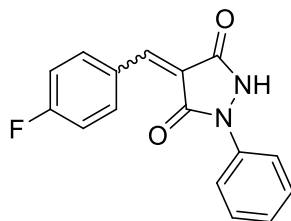
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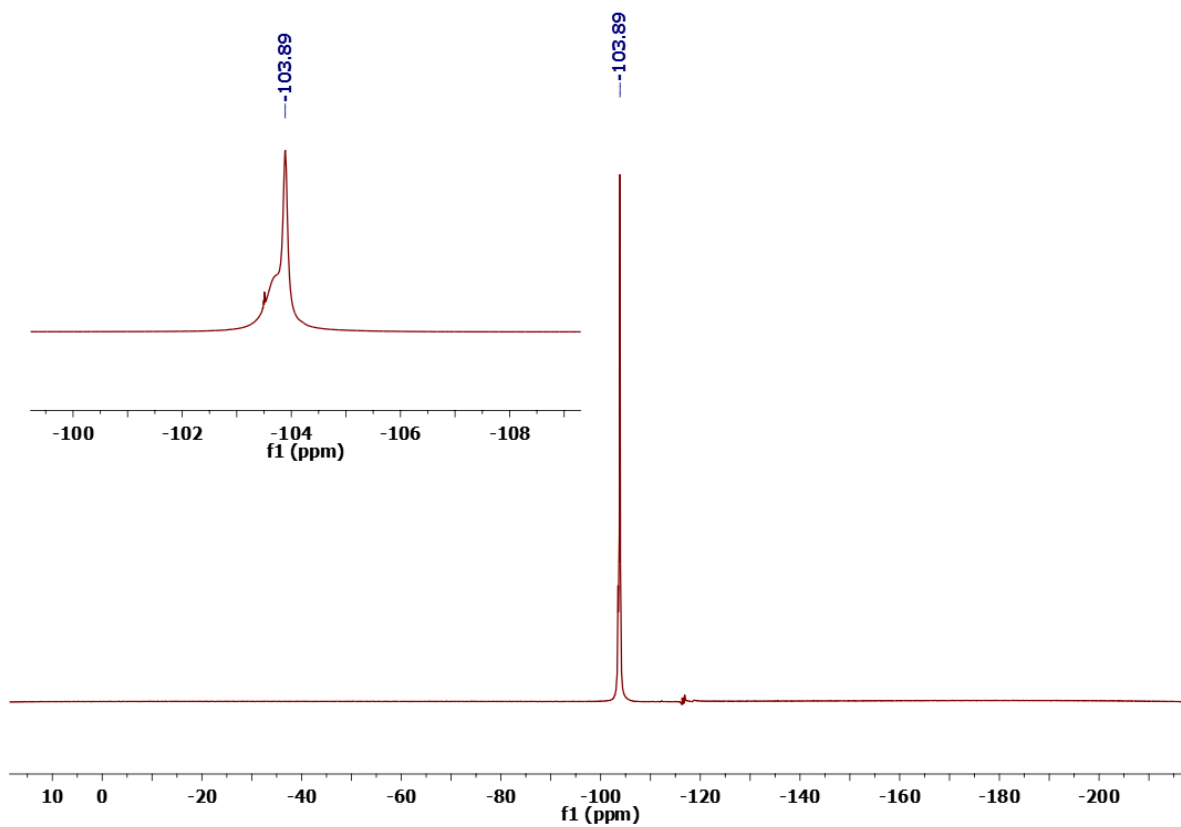
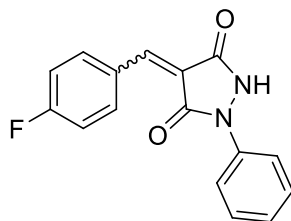
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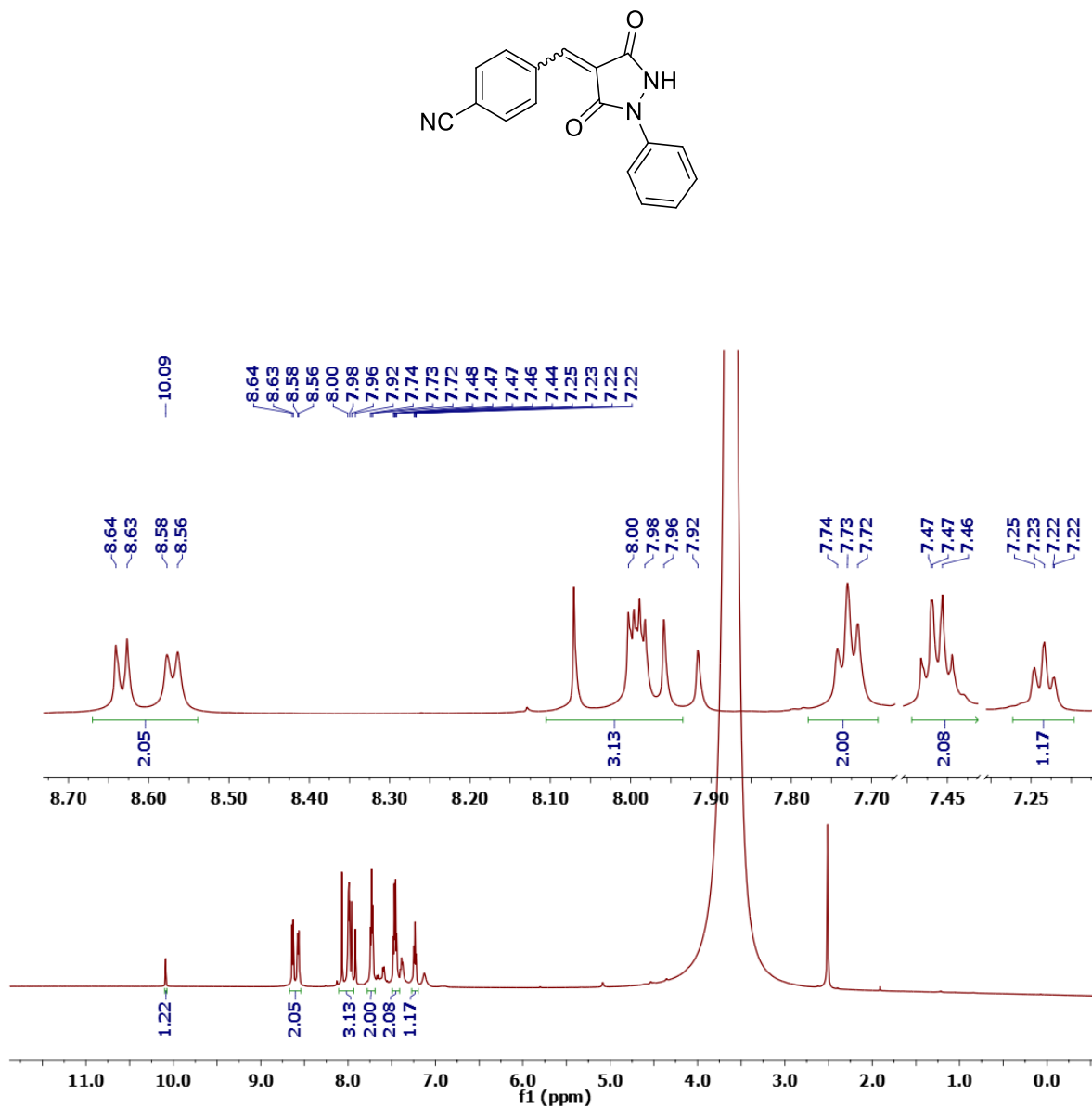
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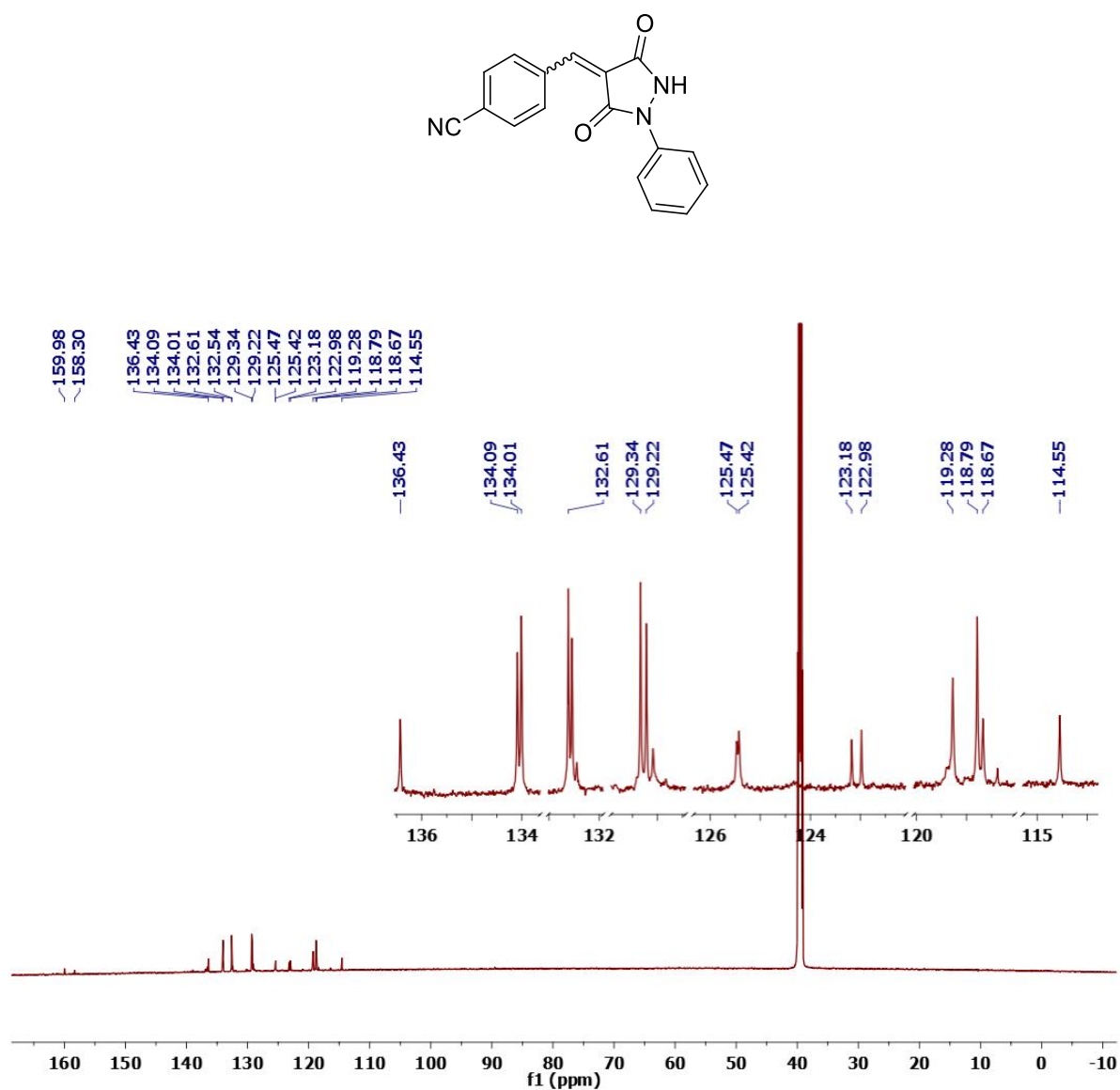
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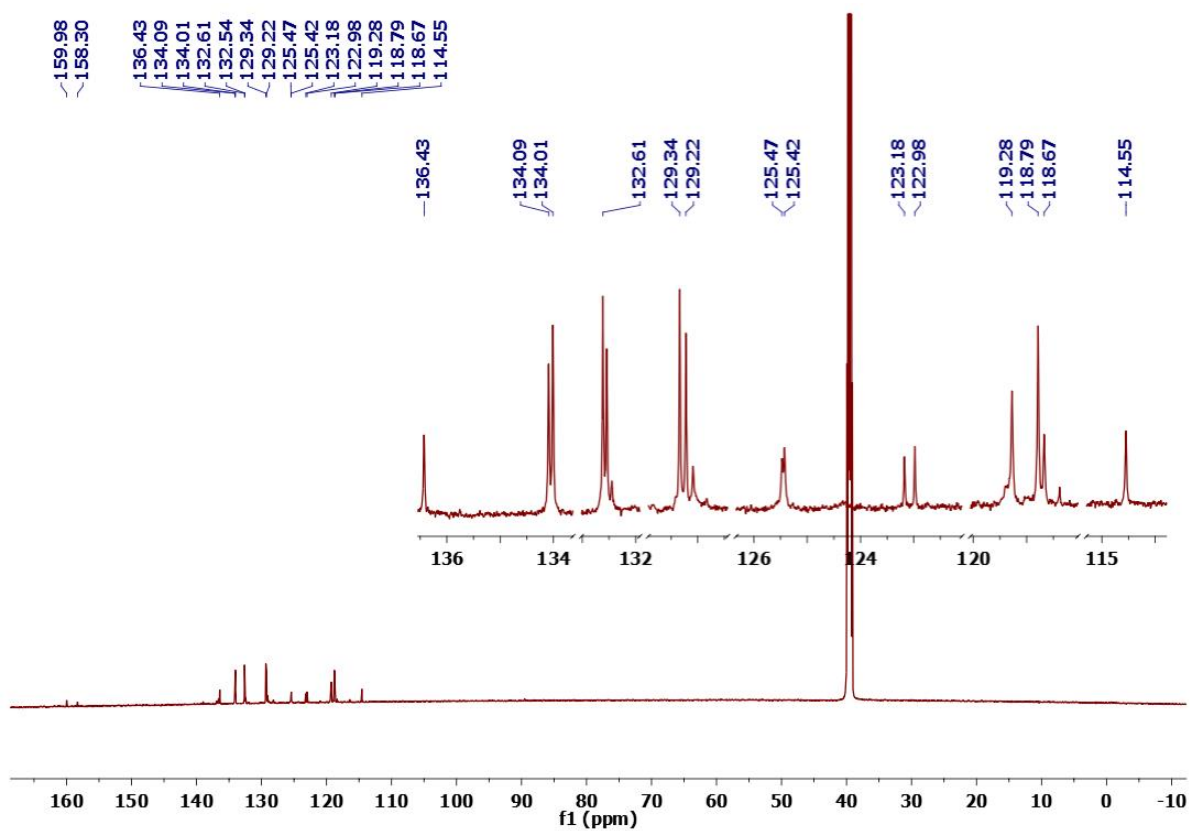
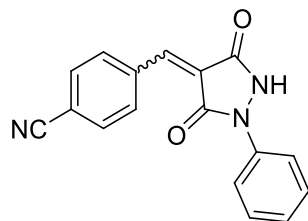
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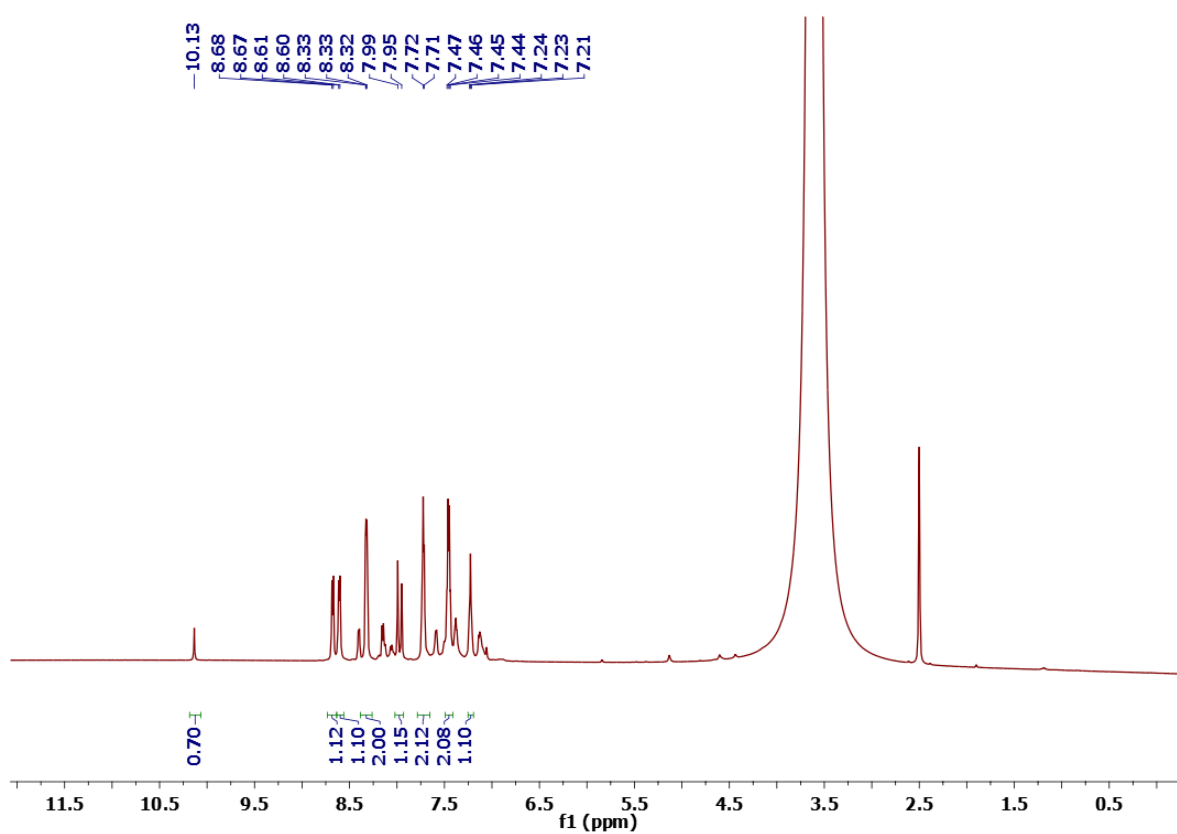
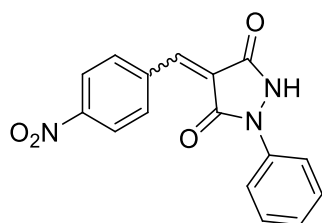
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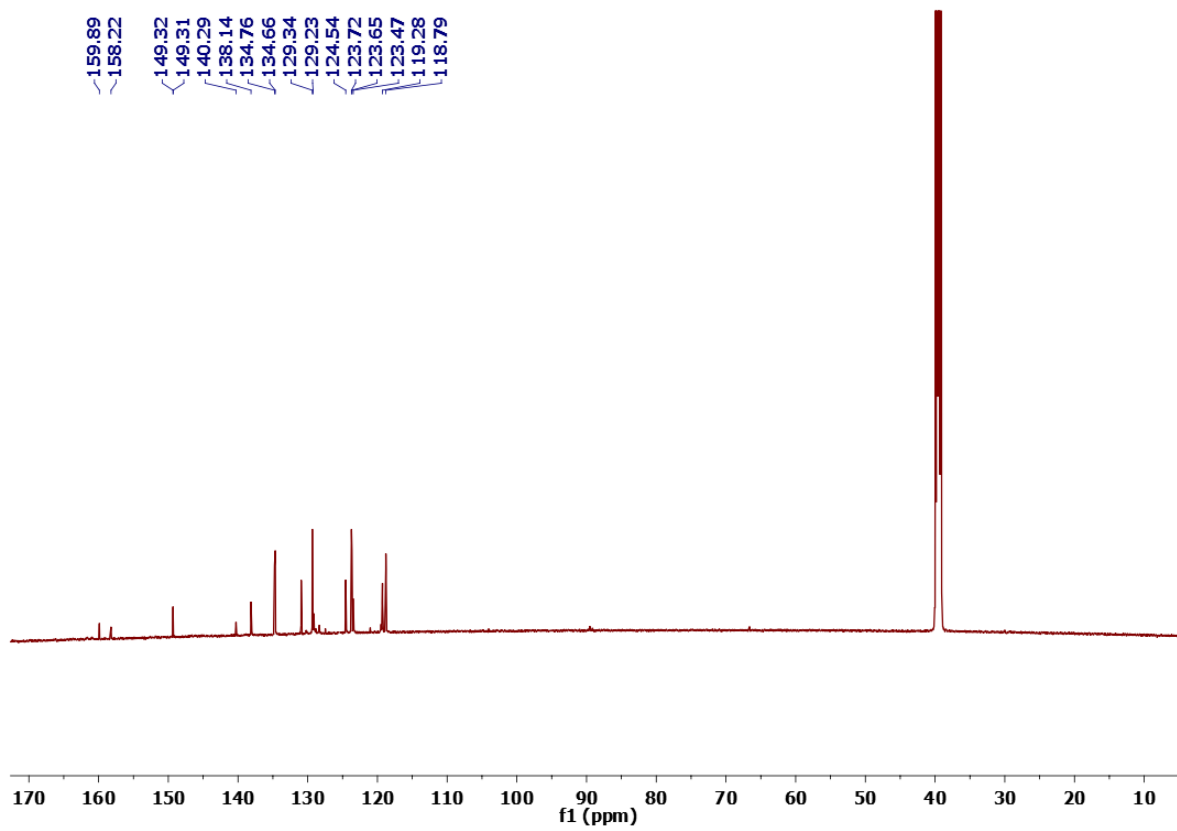
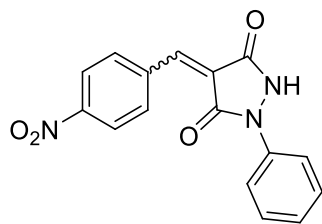
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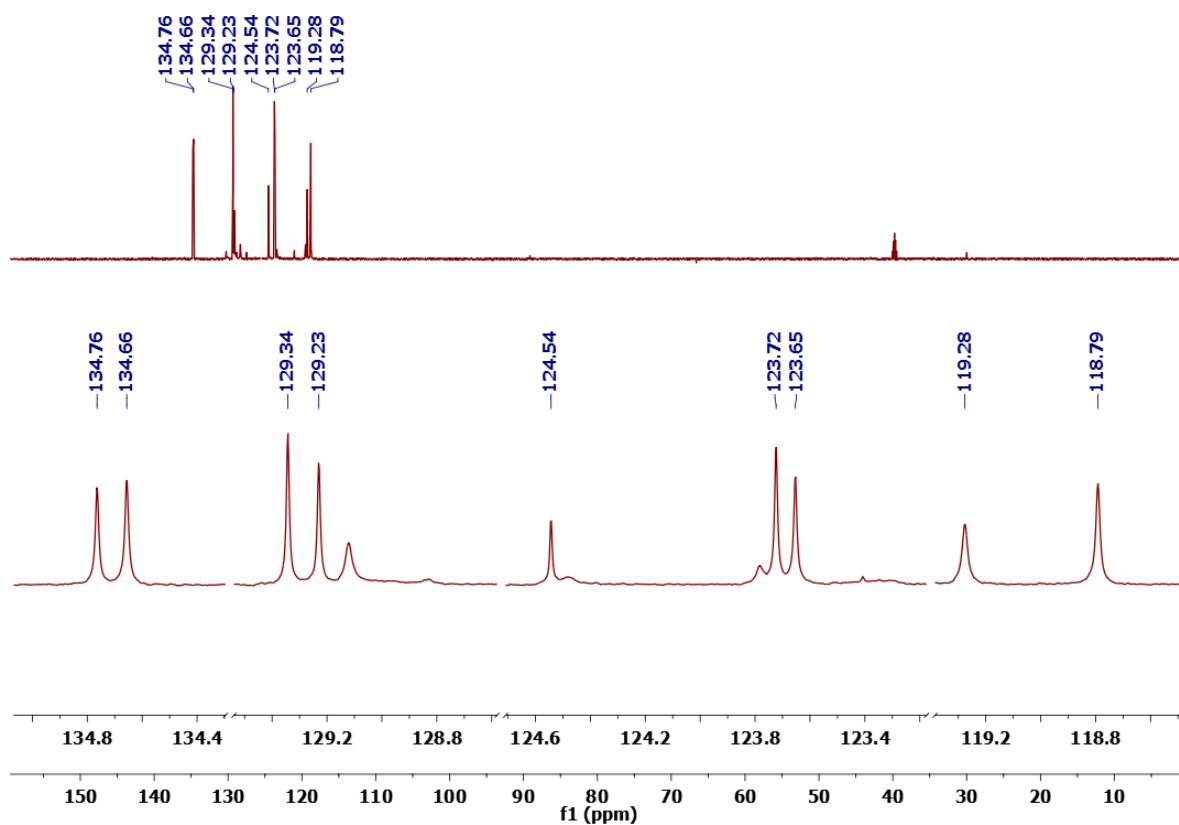
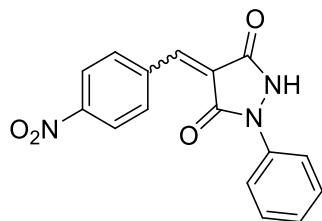
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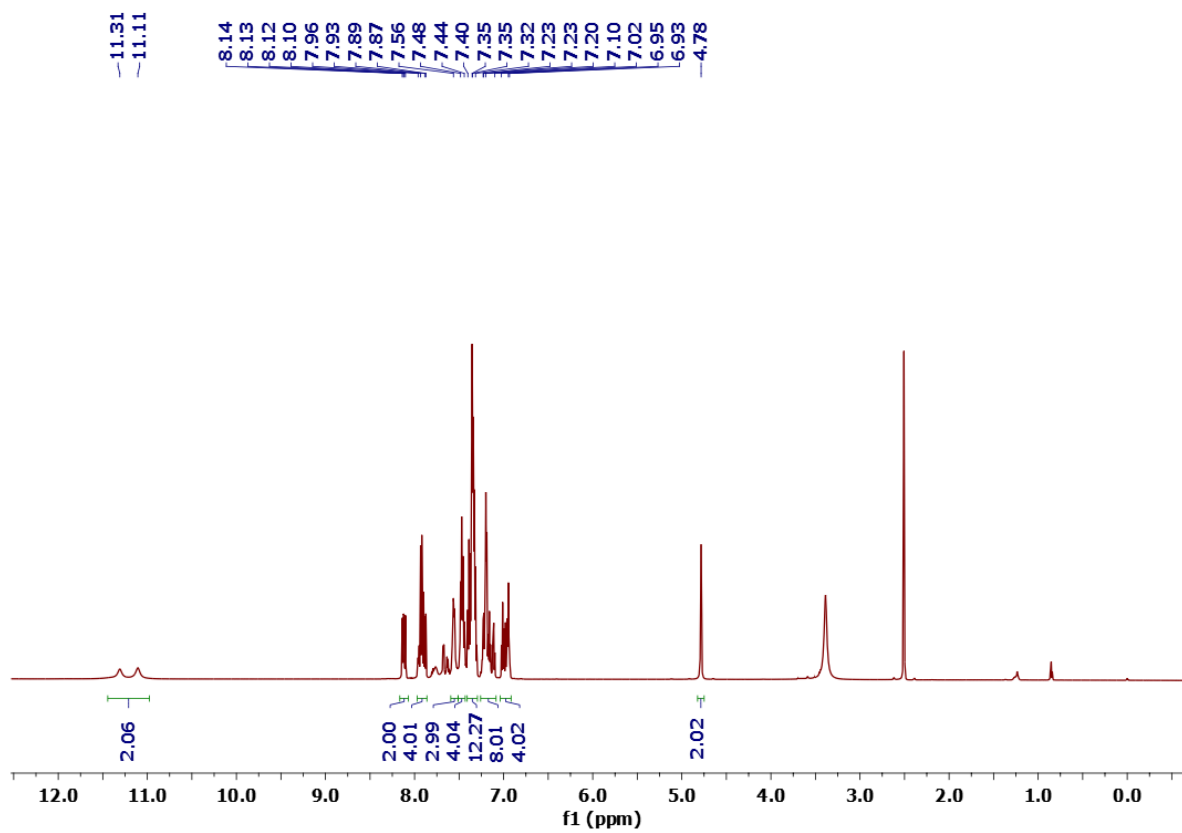
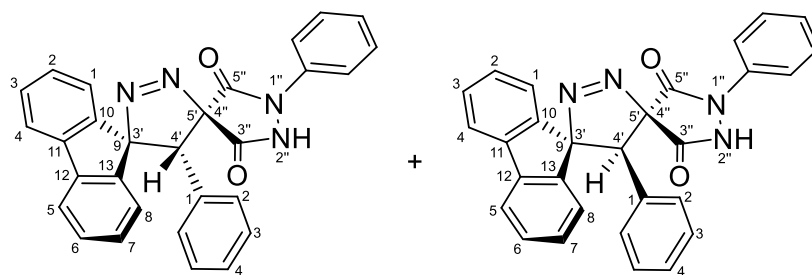
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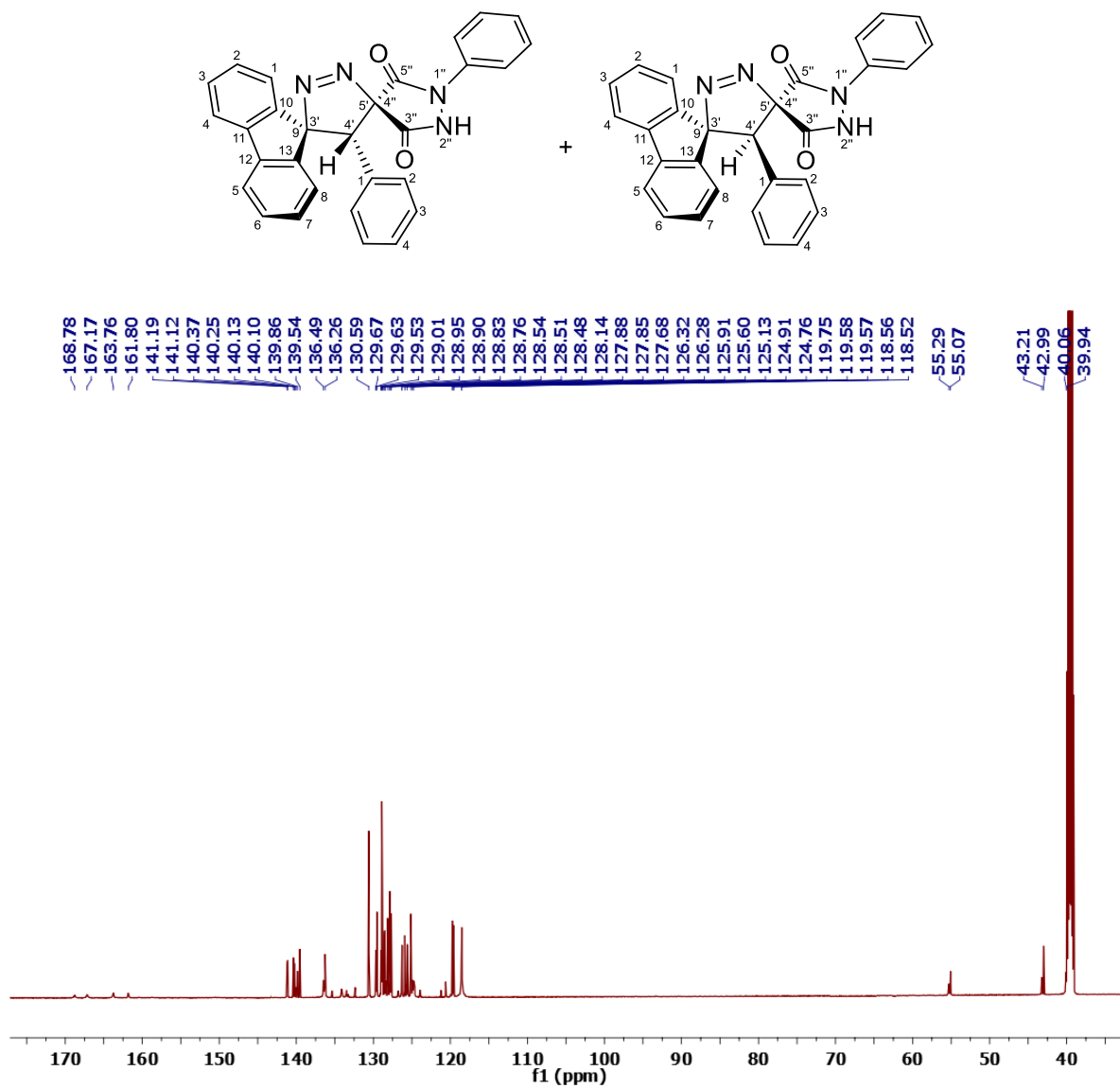
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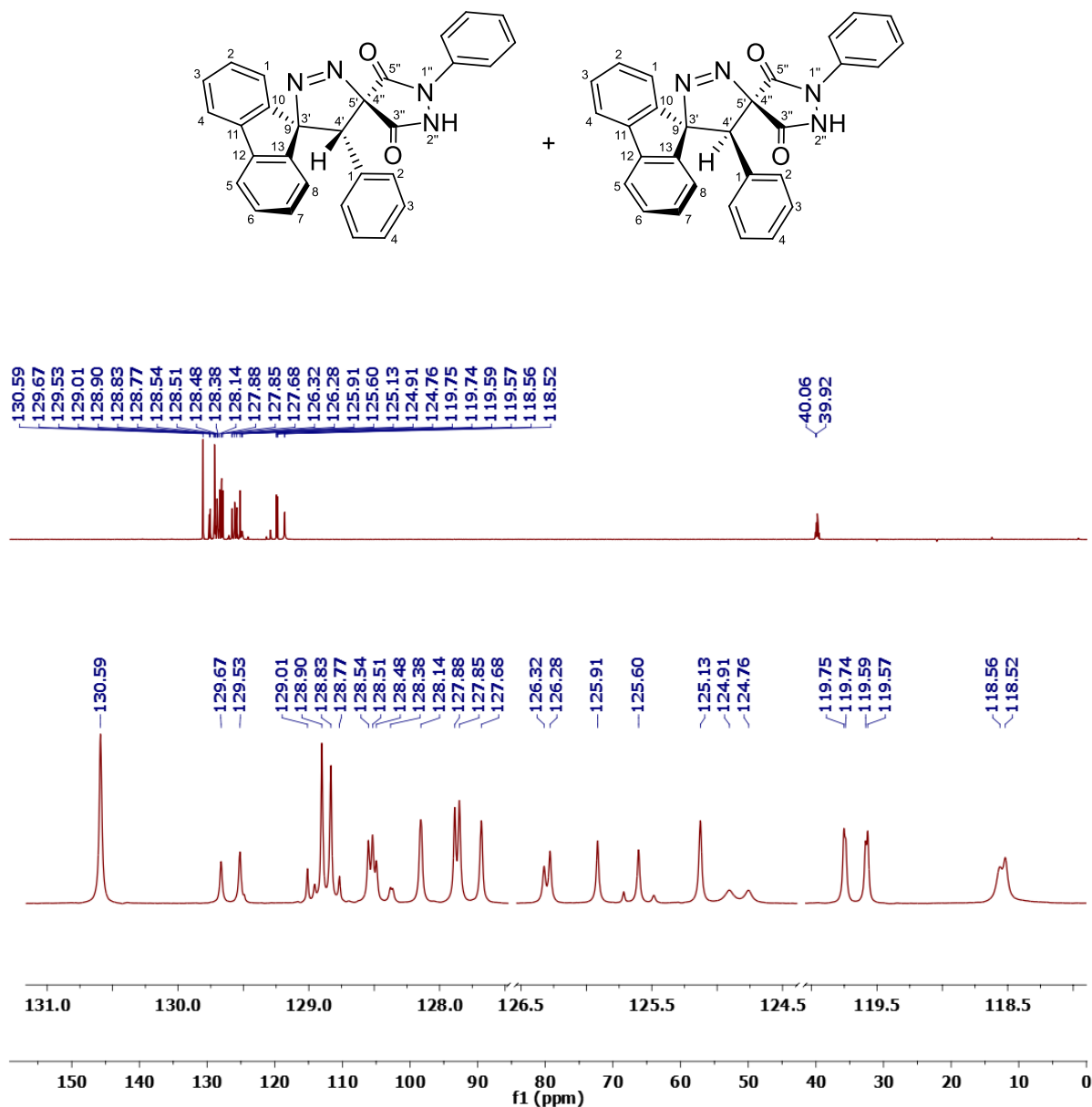
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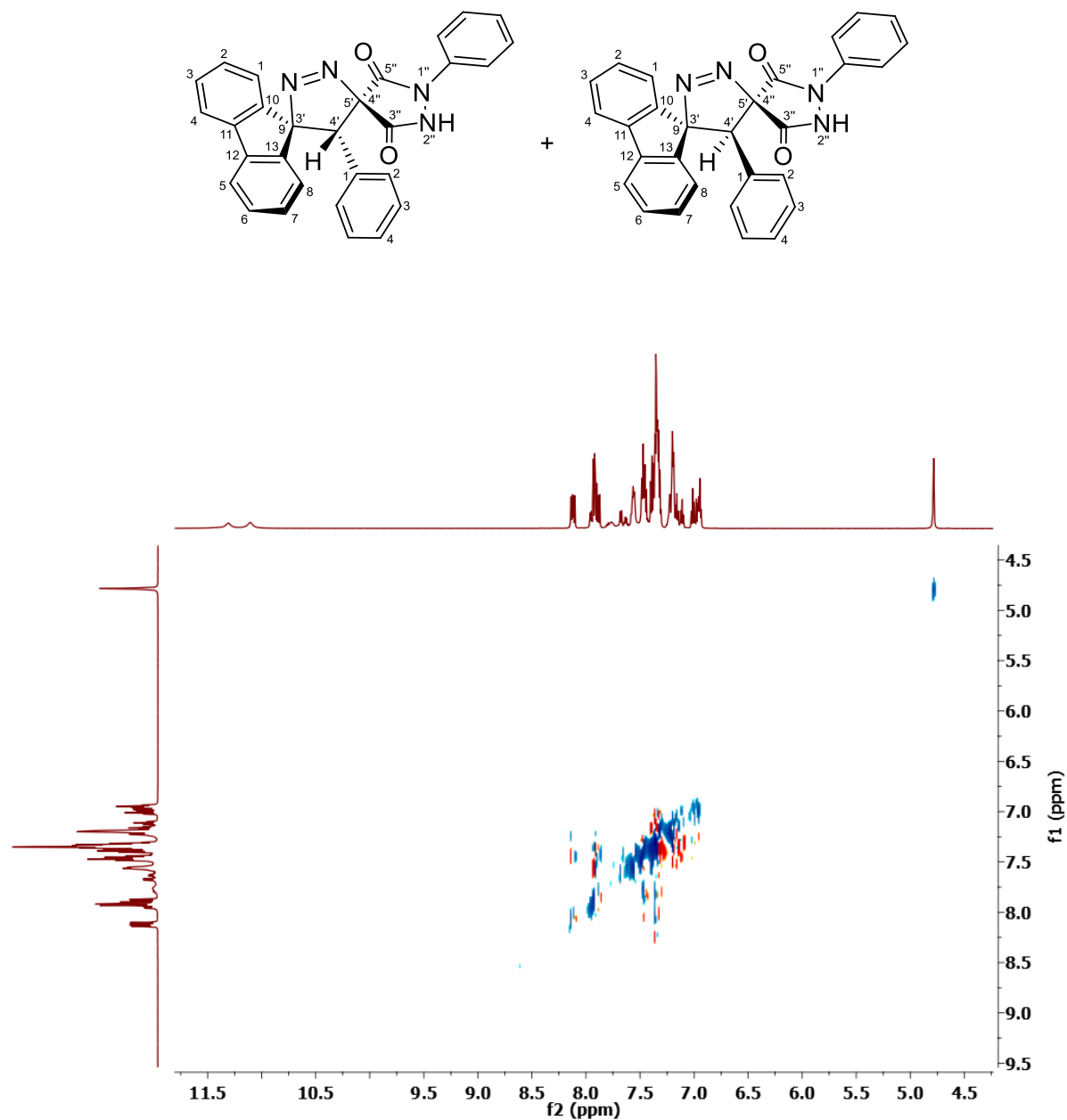
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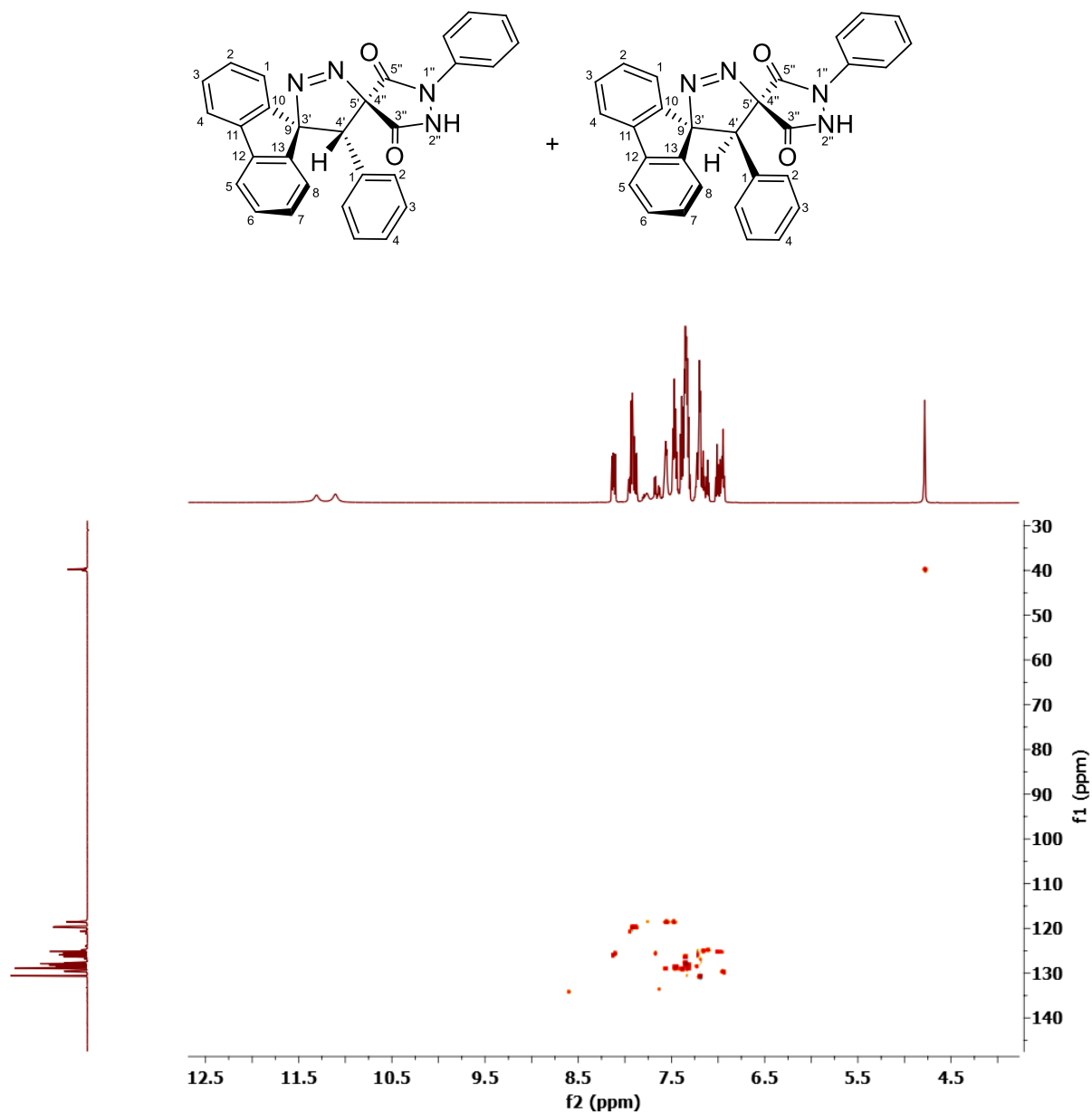
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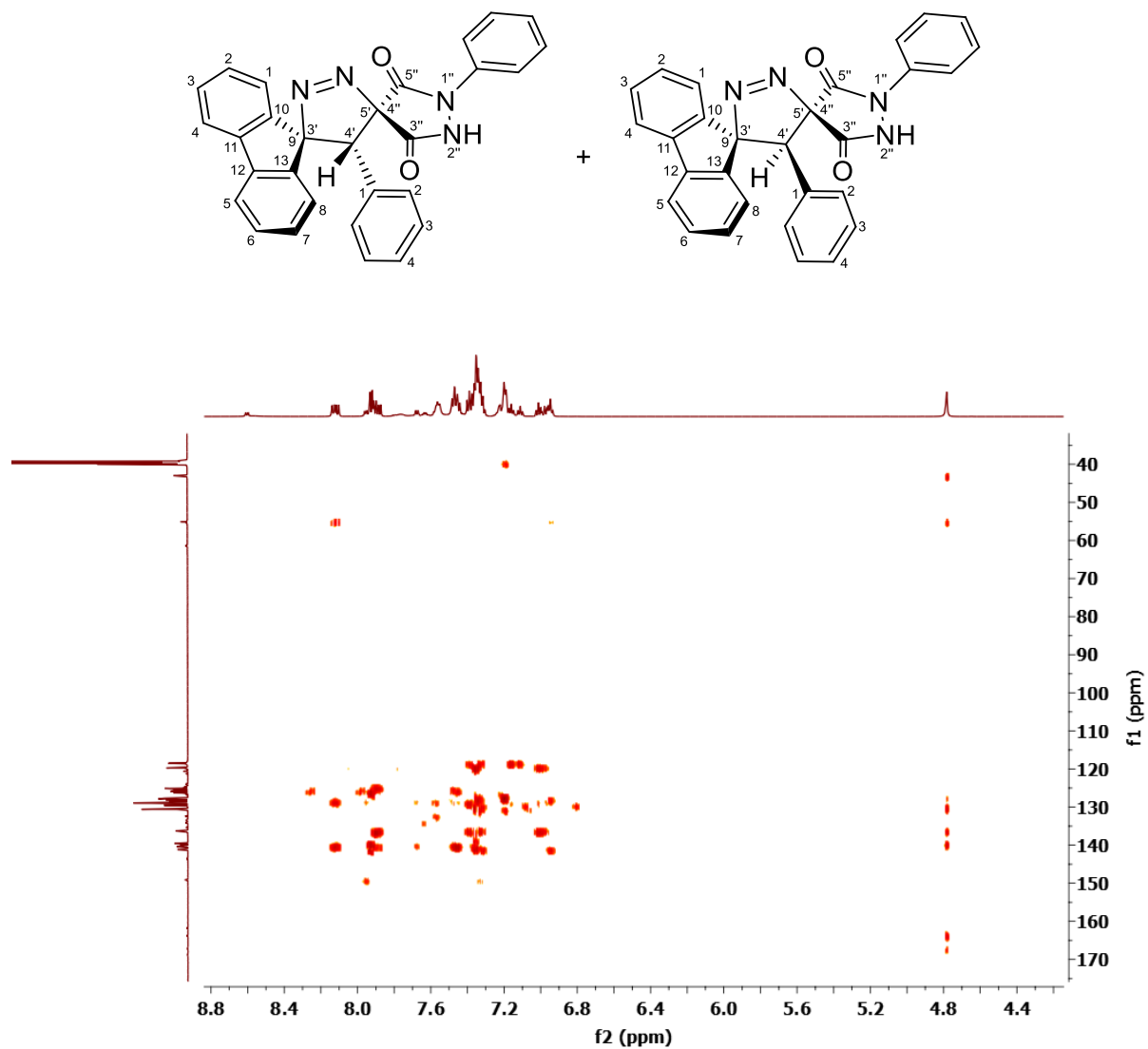
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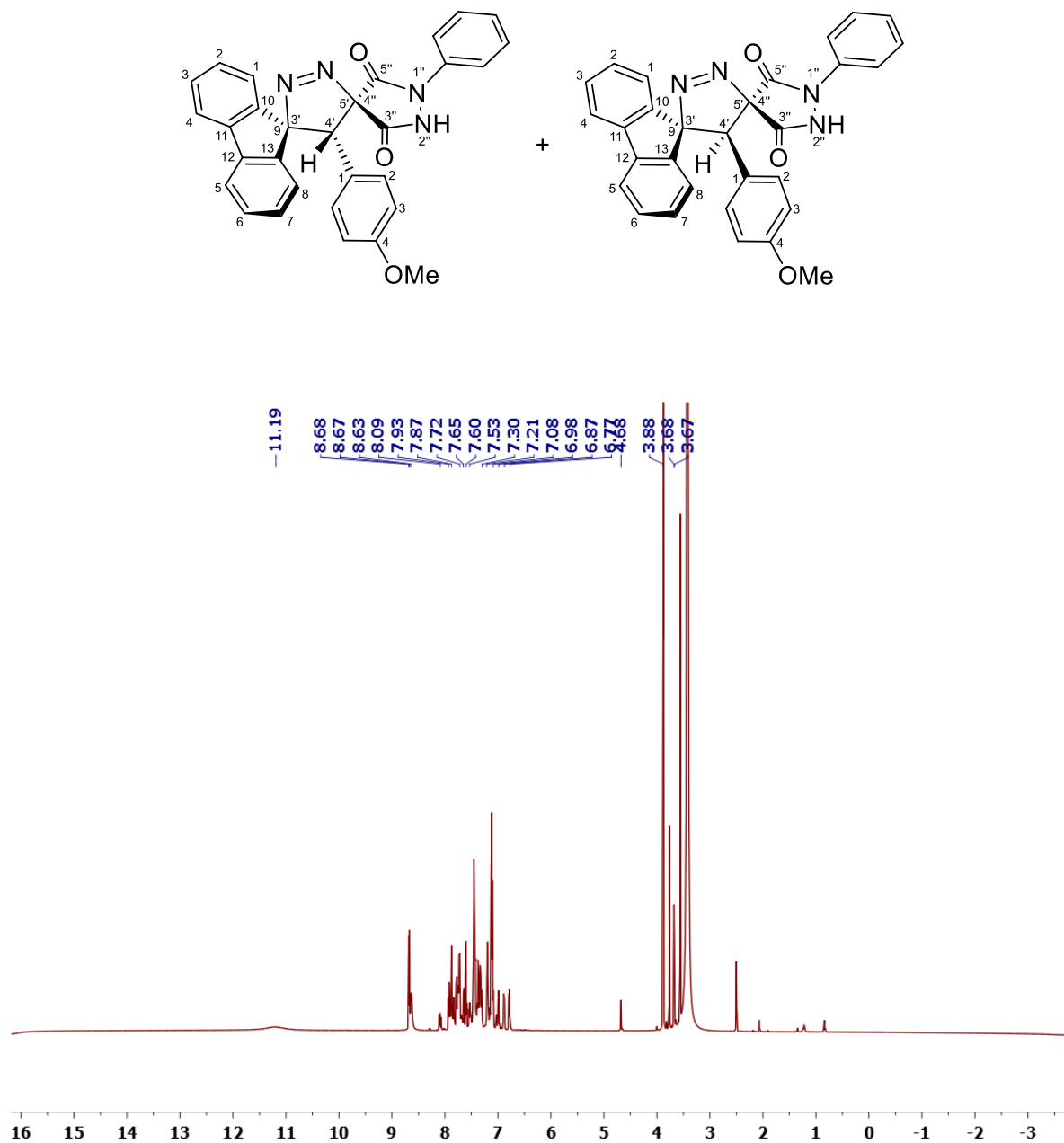
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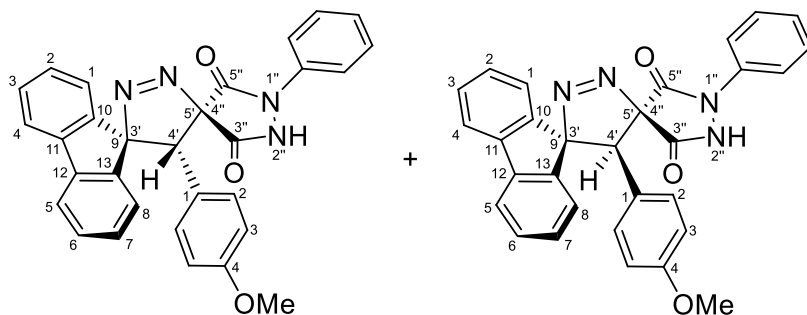
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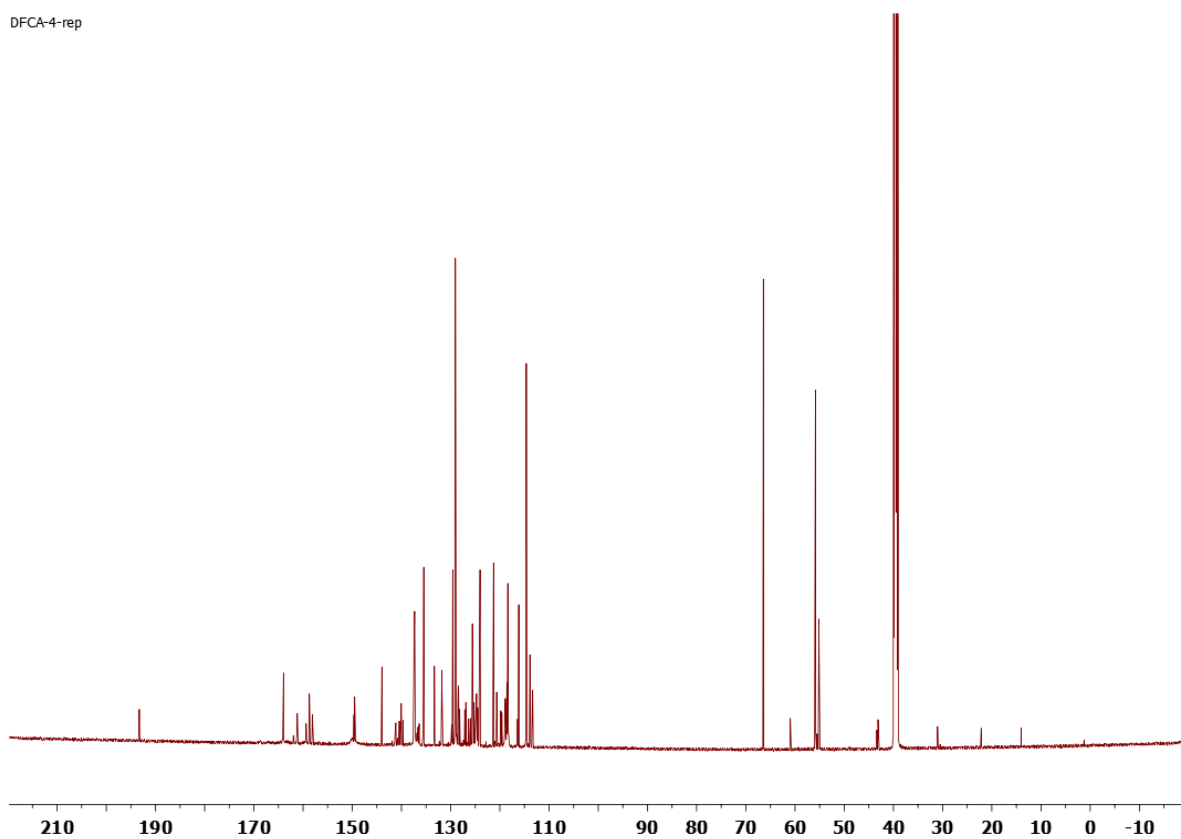
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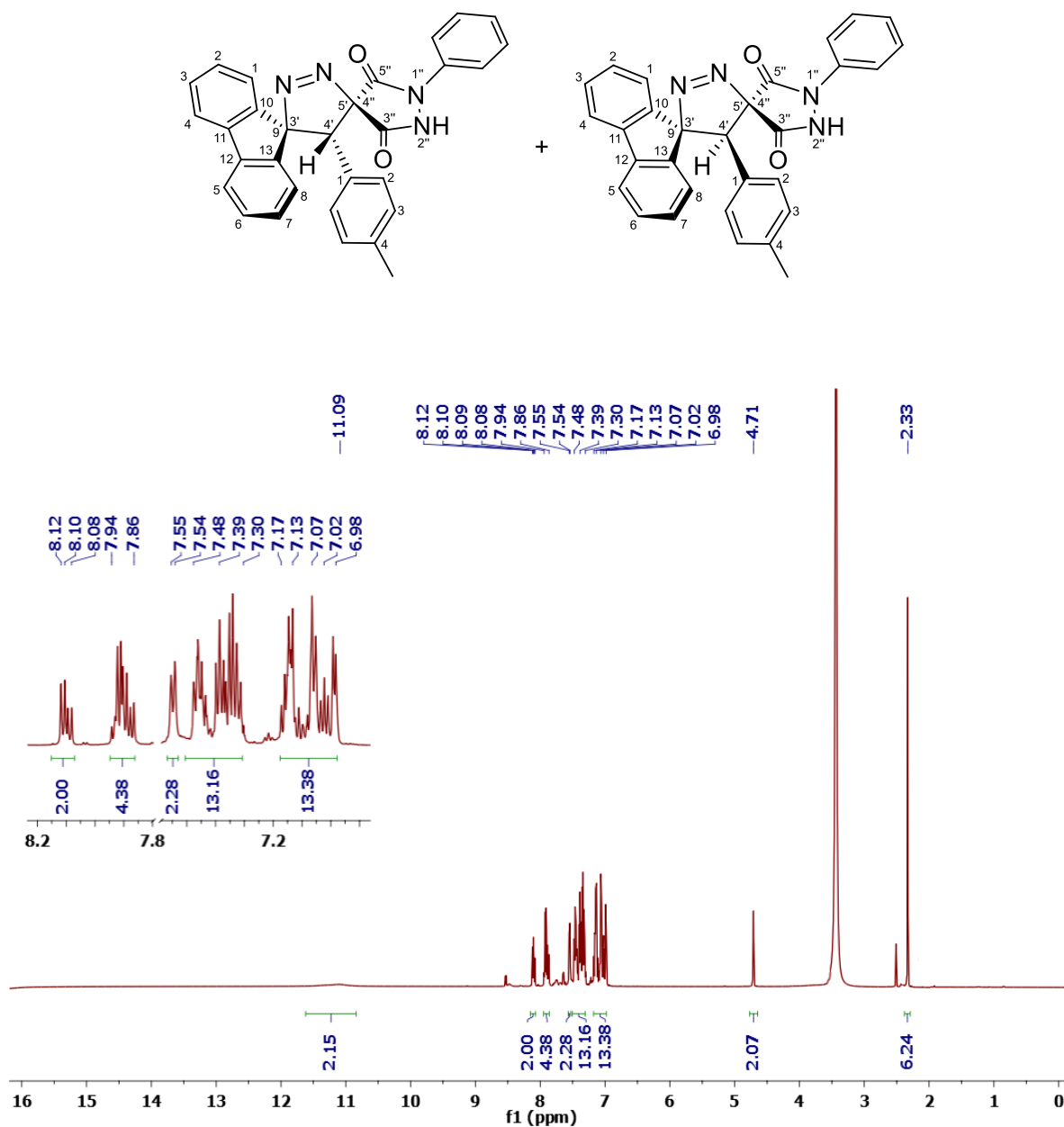
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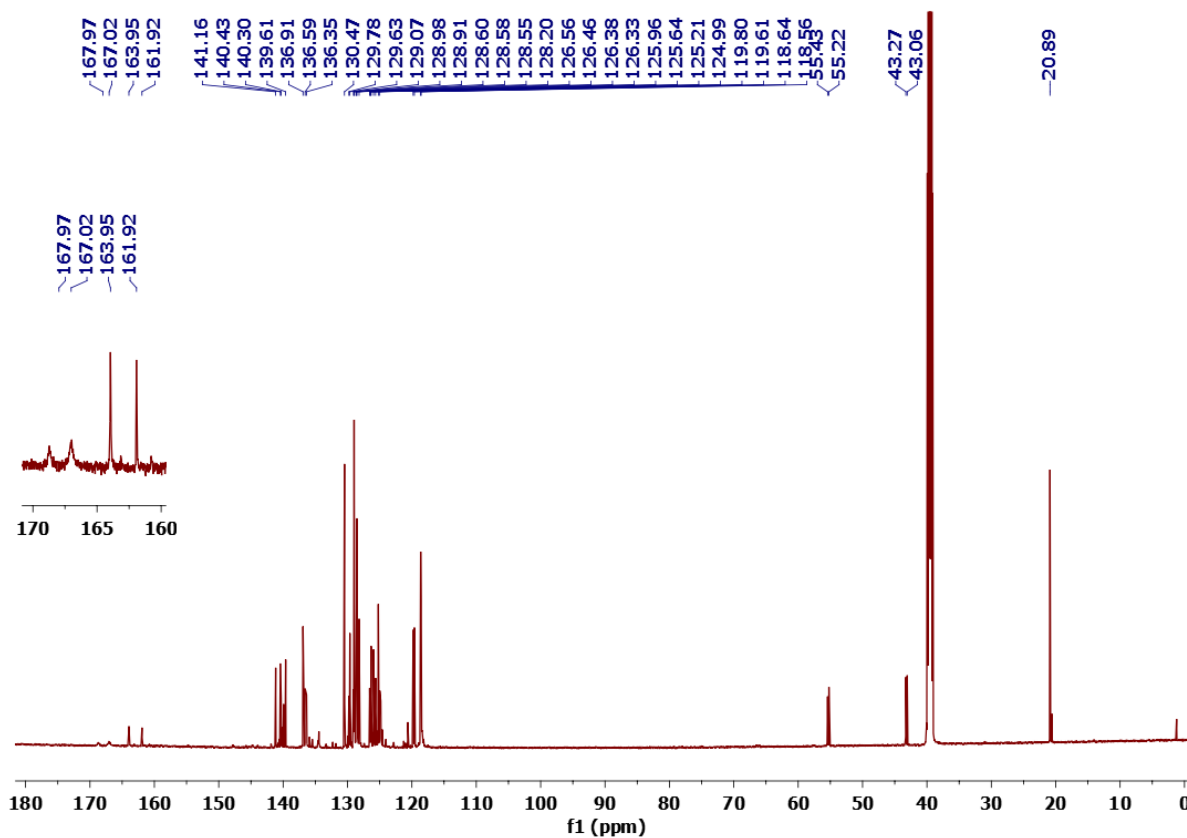
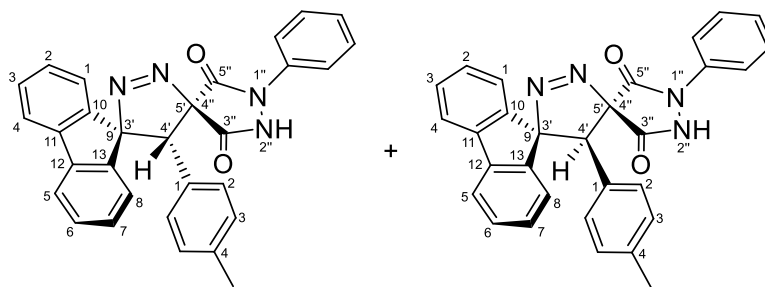
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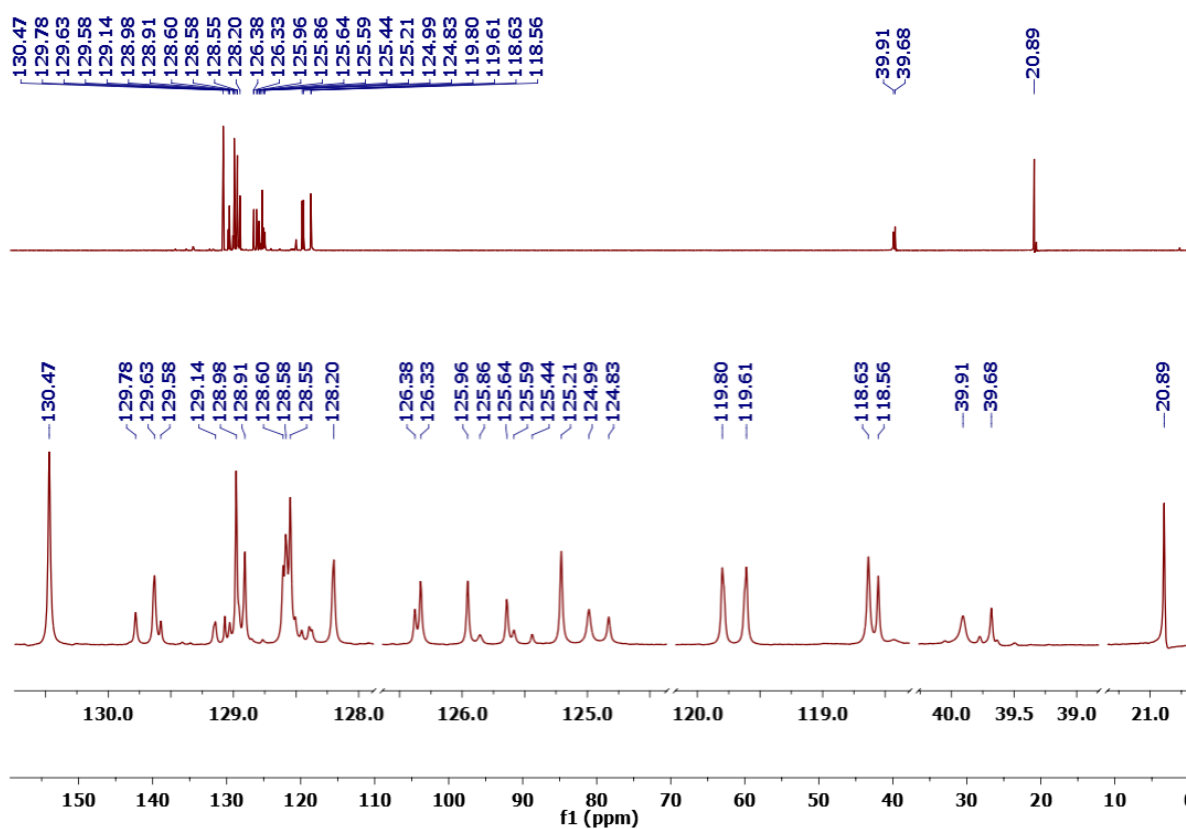
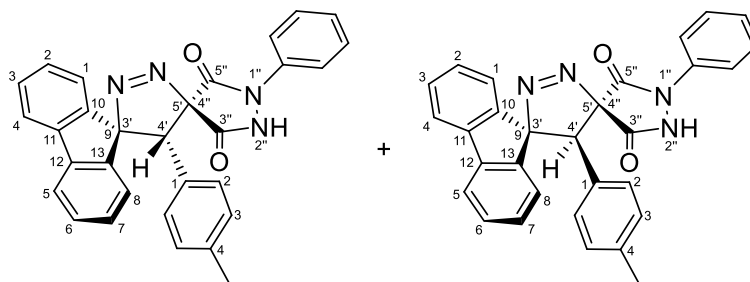
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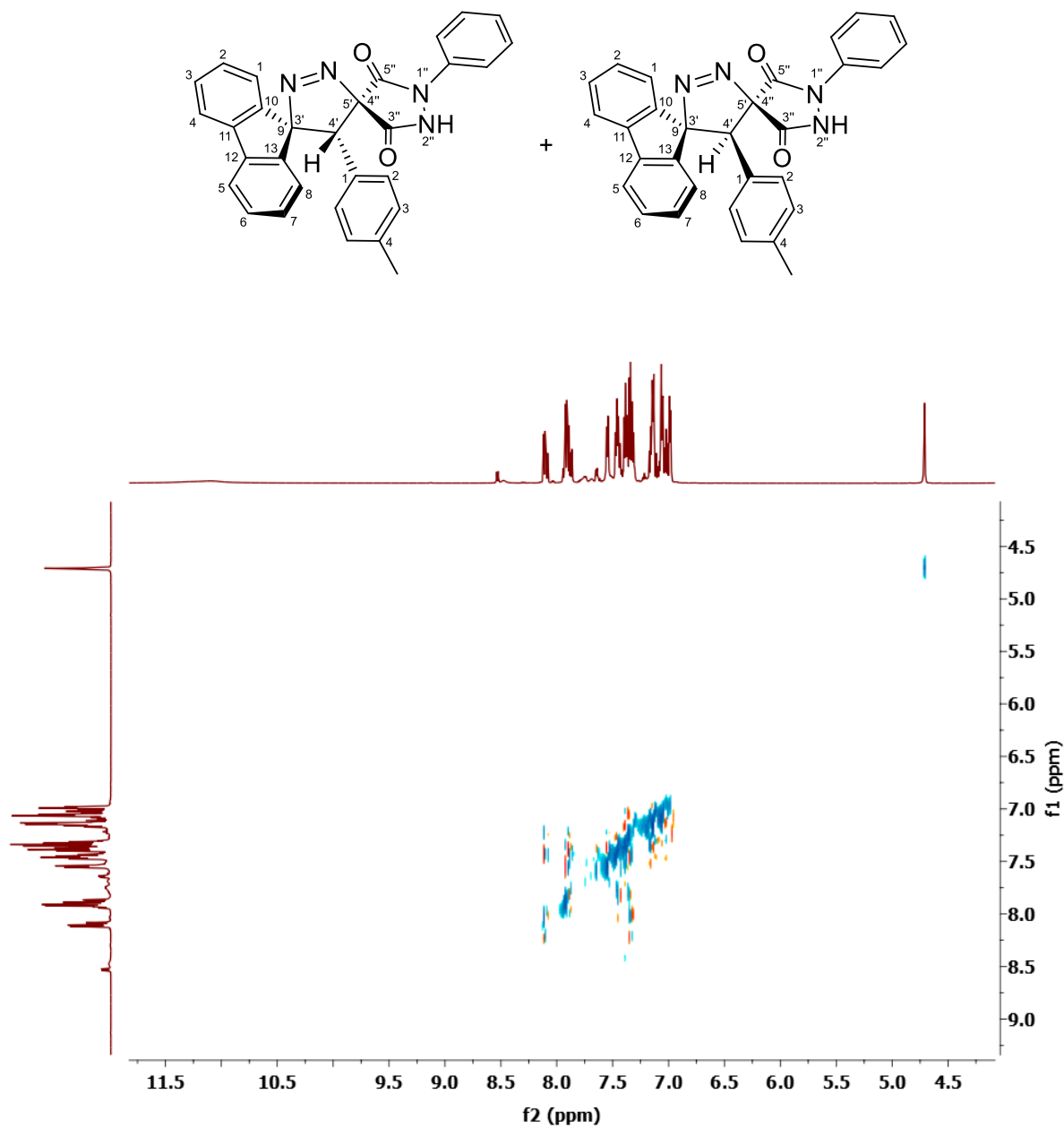
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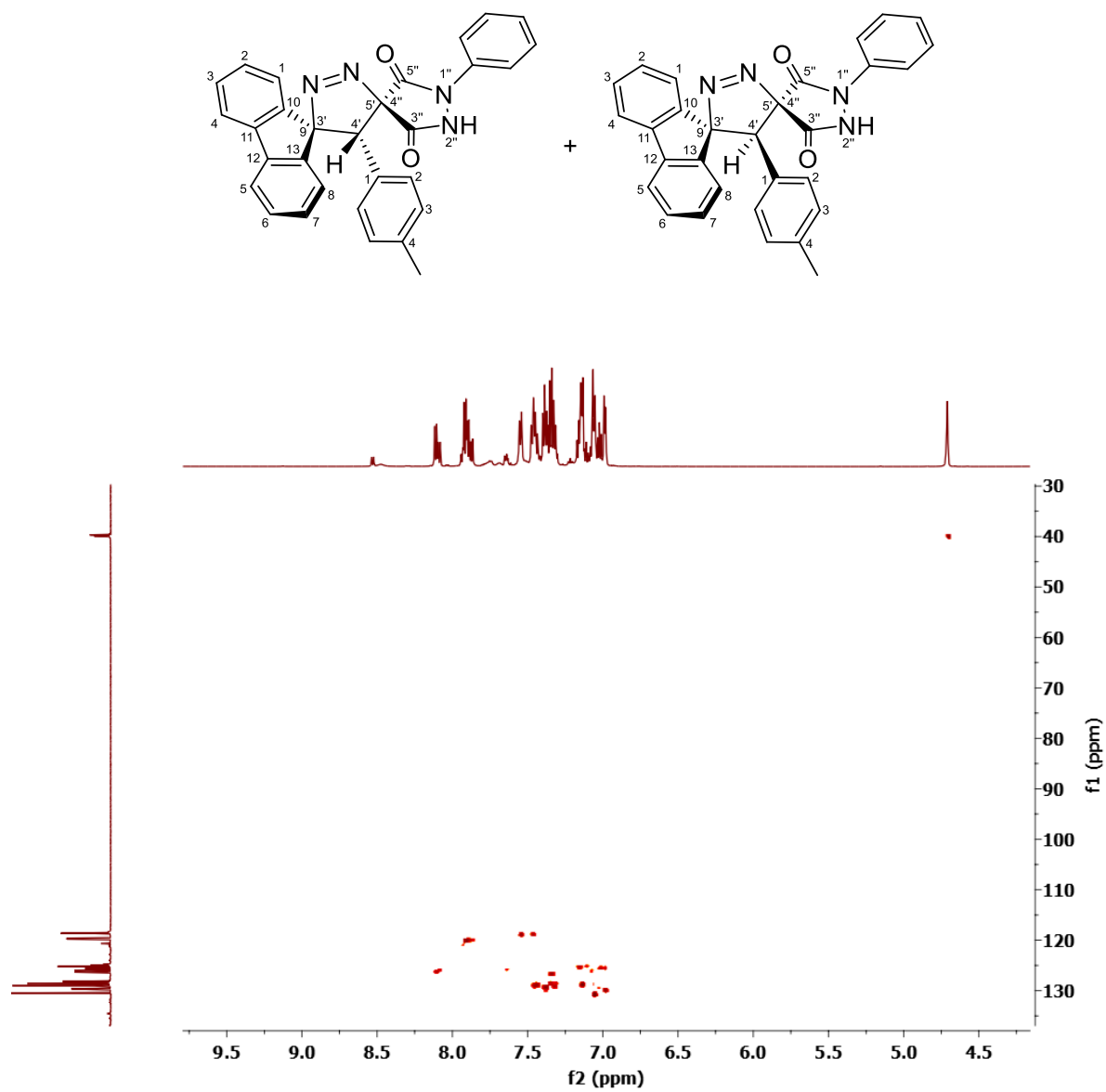
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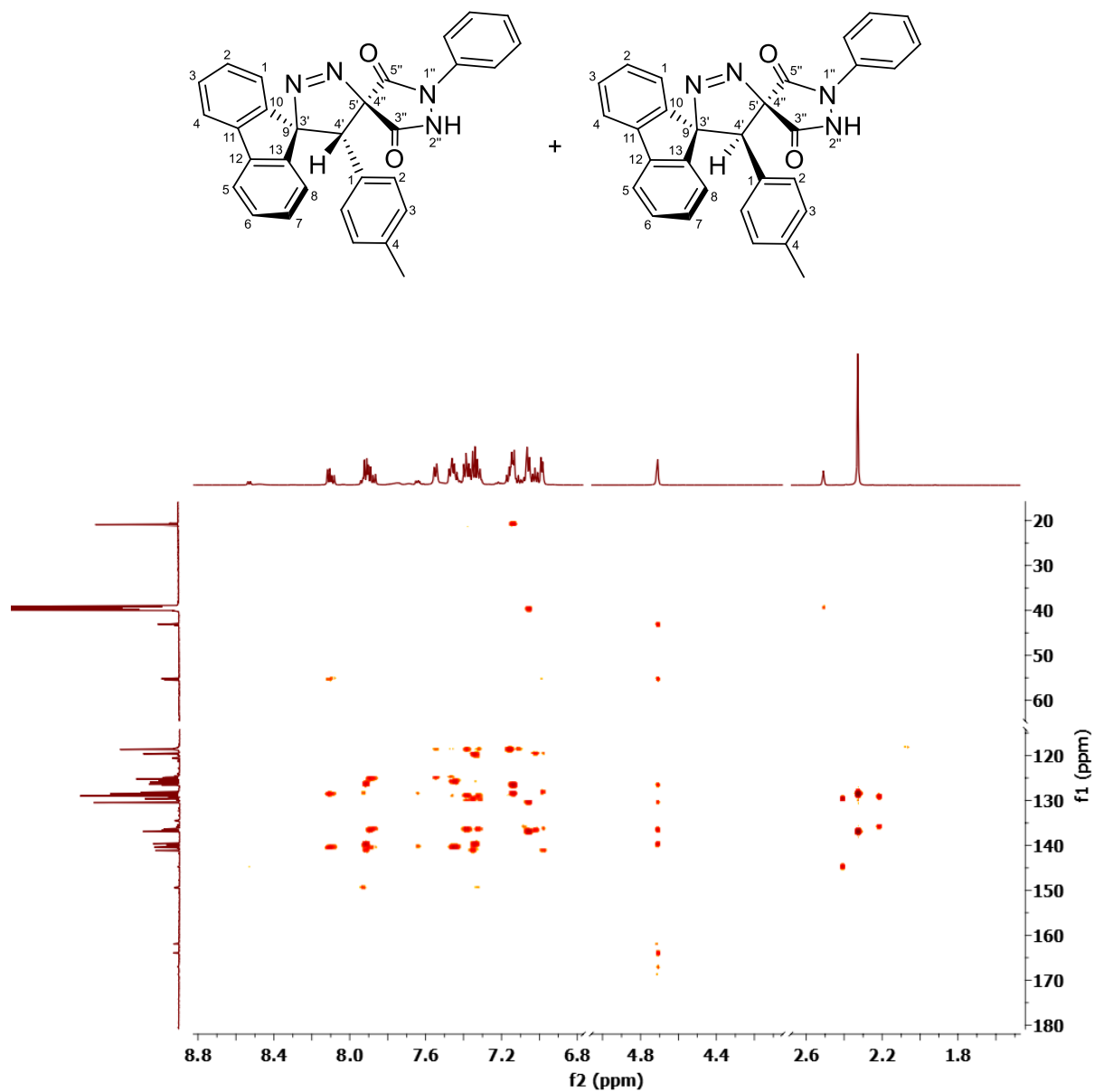
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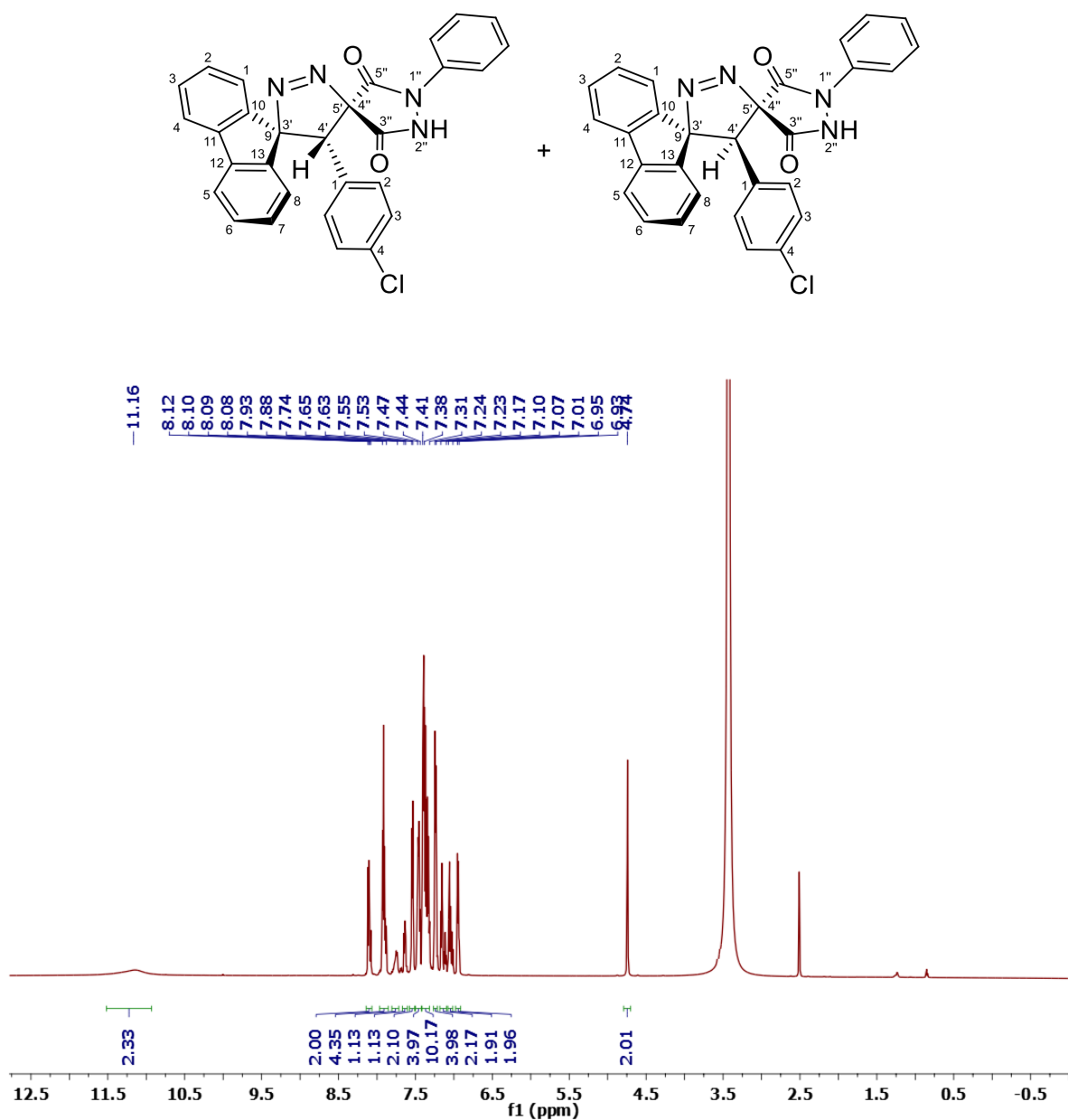
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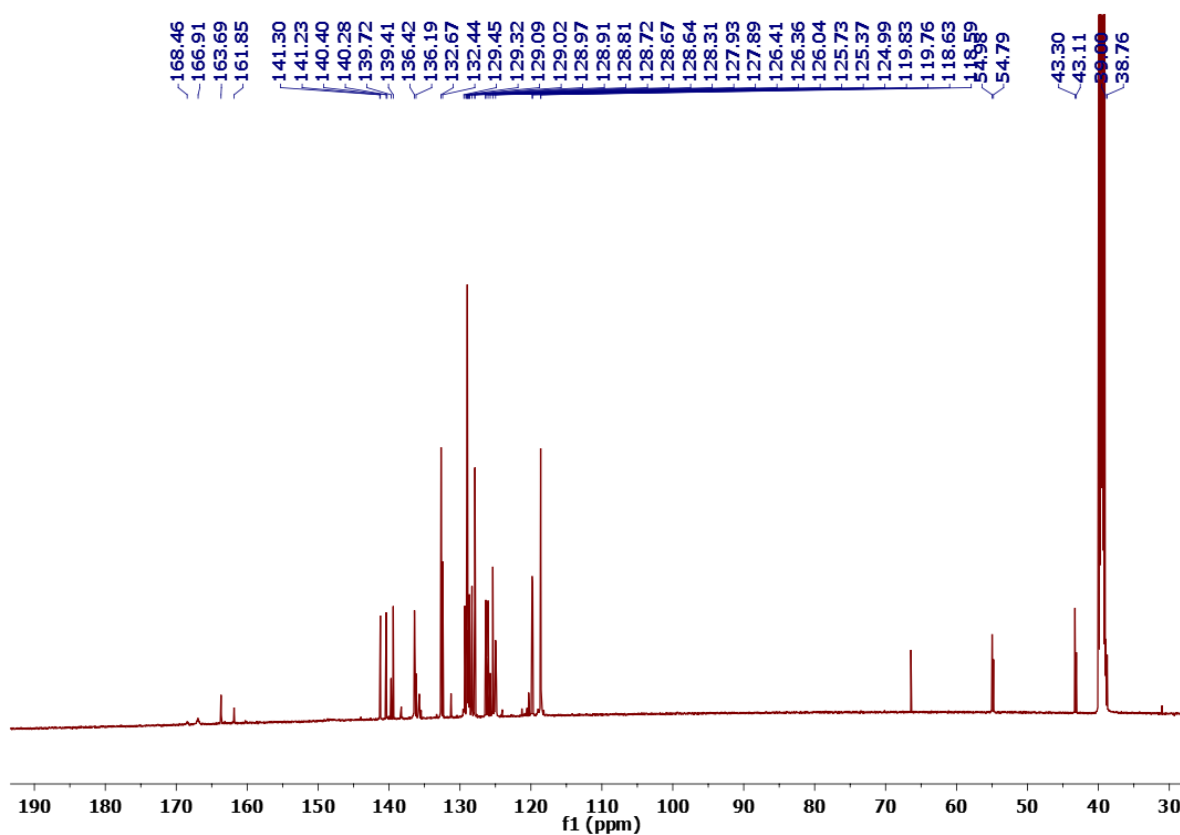
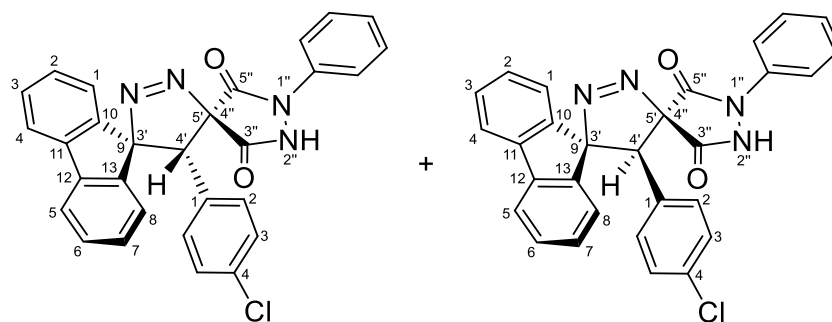
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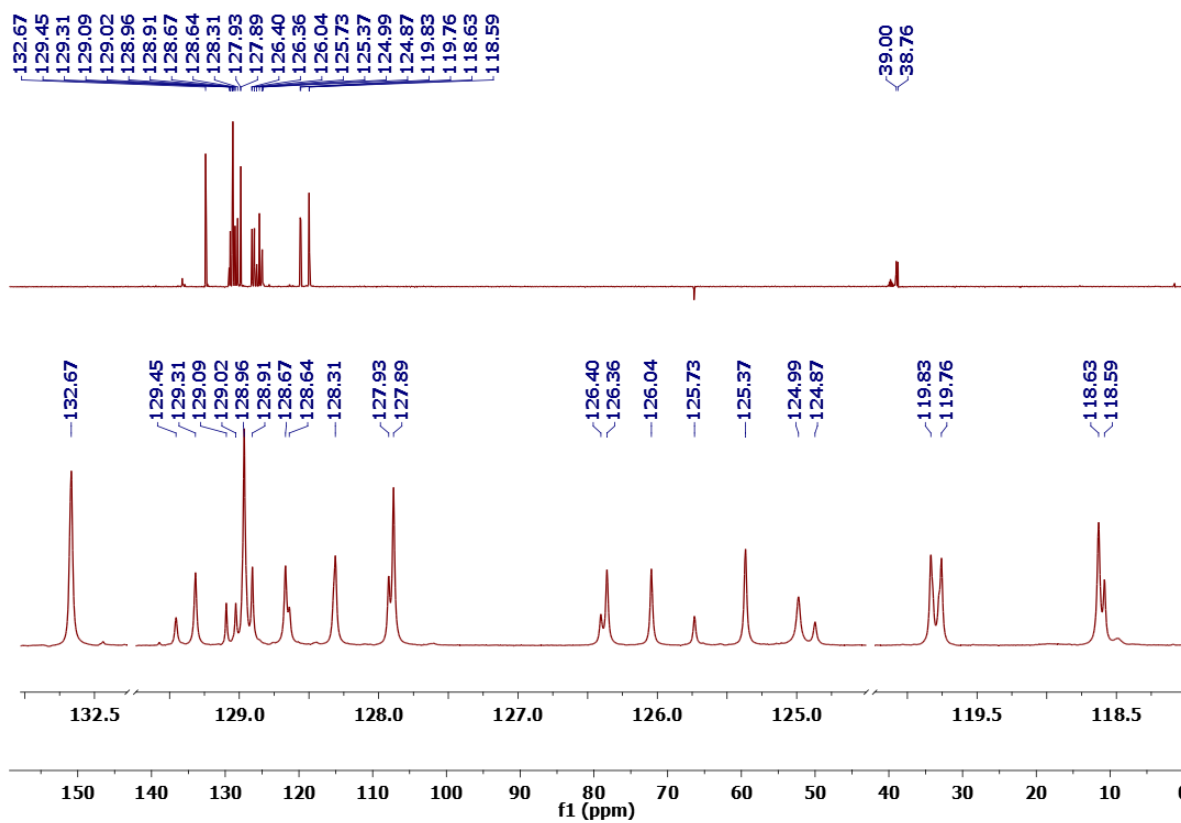
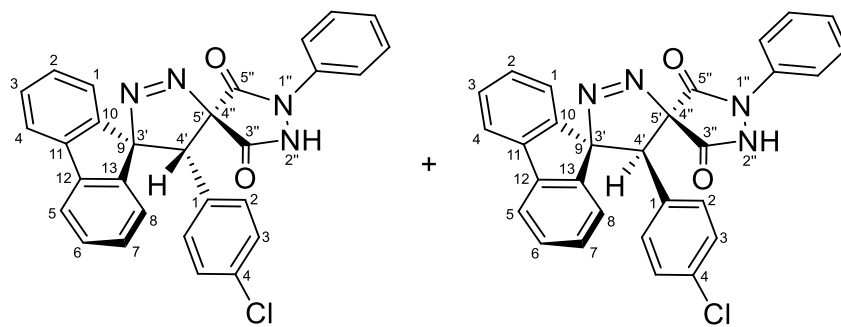
¹H NMR spectrum of (4'R,5'R)-4'-(4-chlorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5d) and (4'S,5'R)-4'-(4-chlorophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'd)



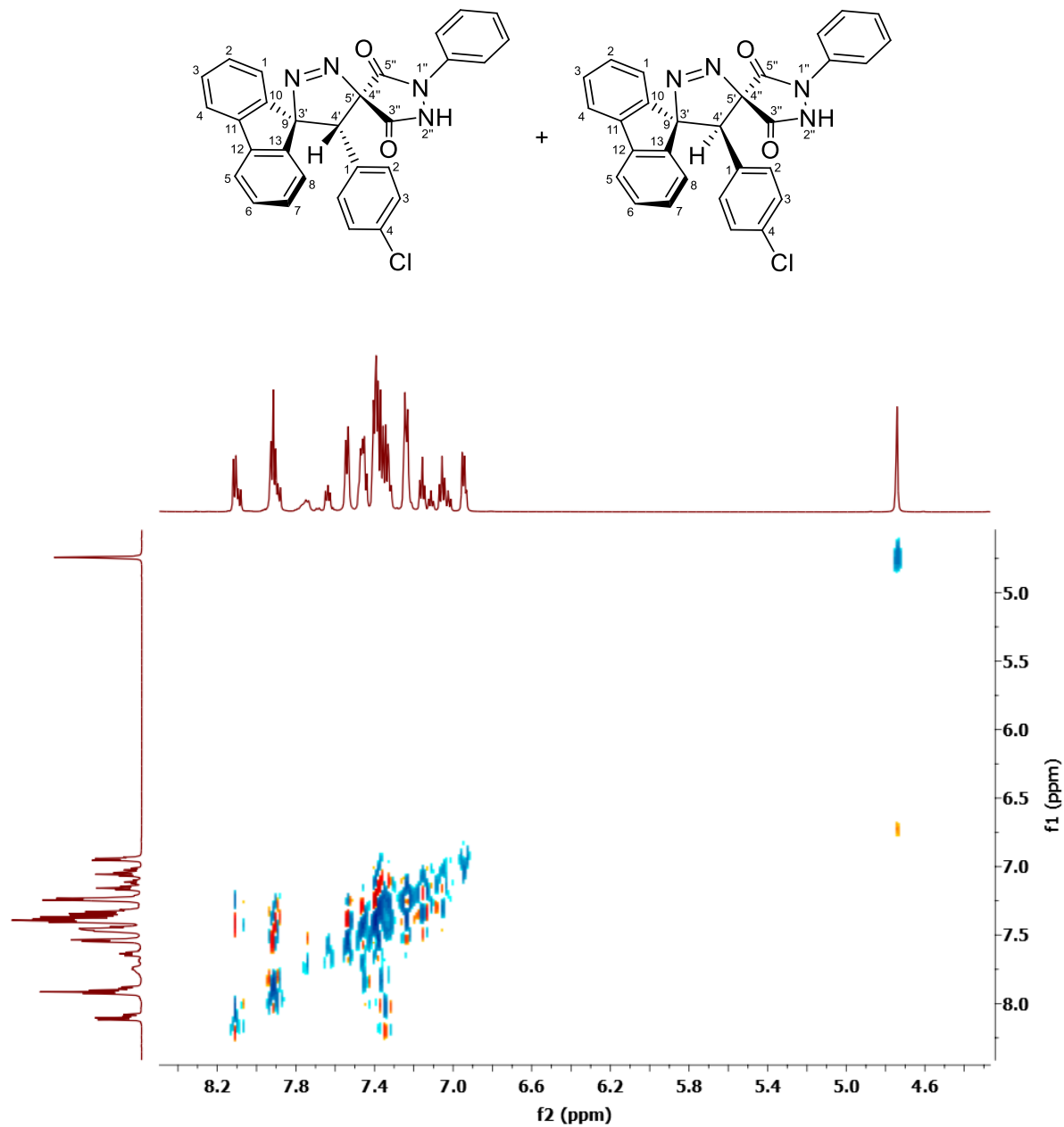
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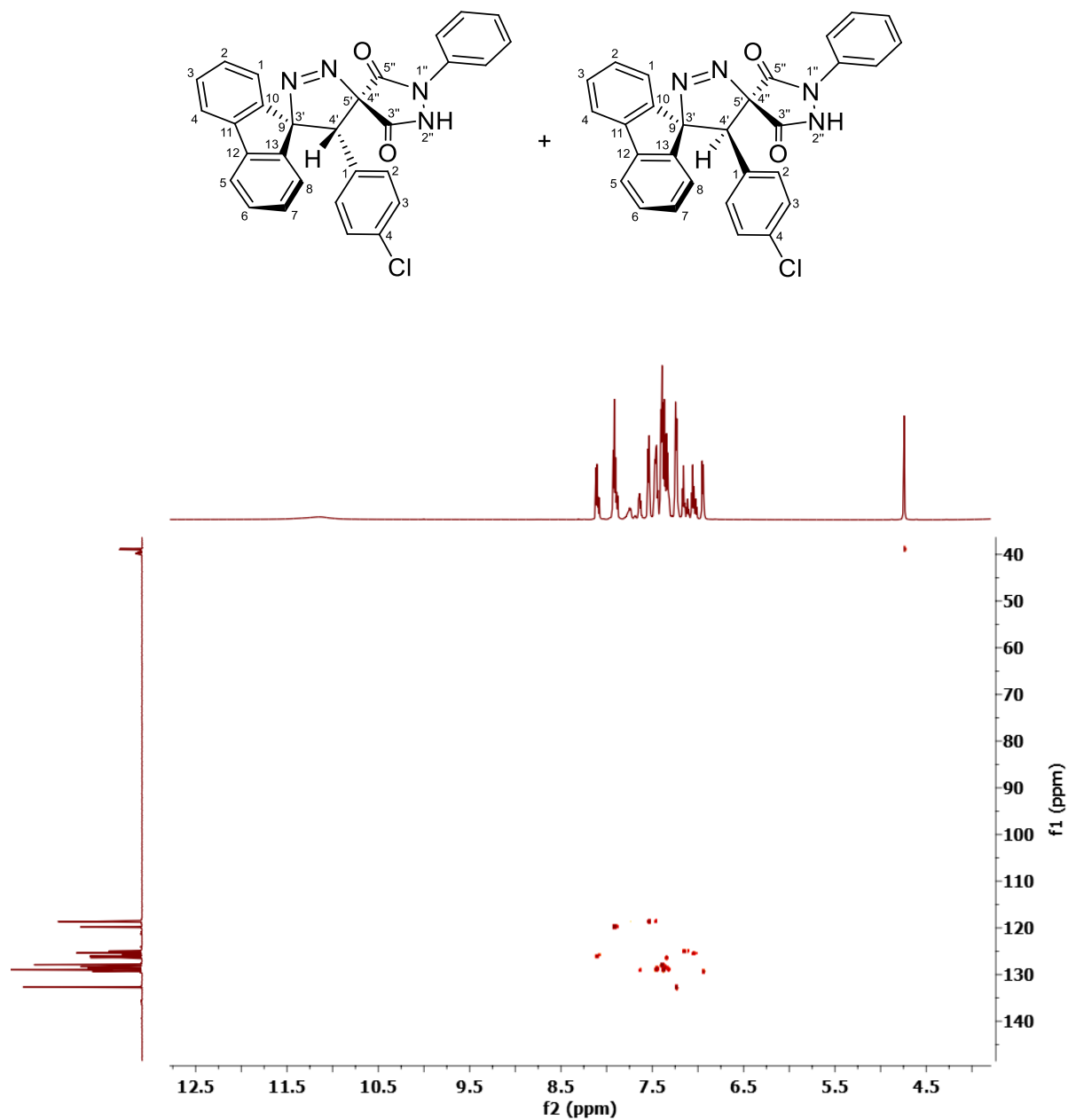
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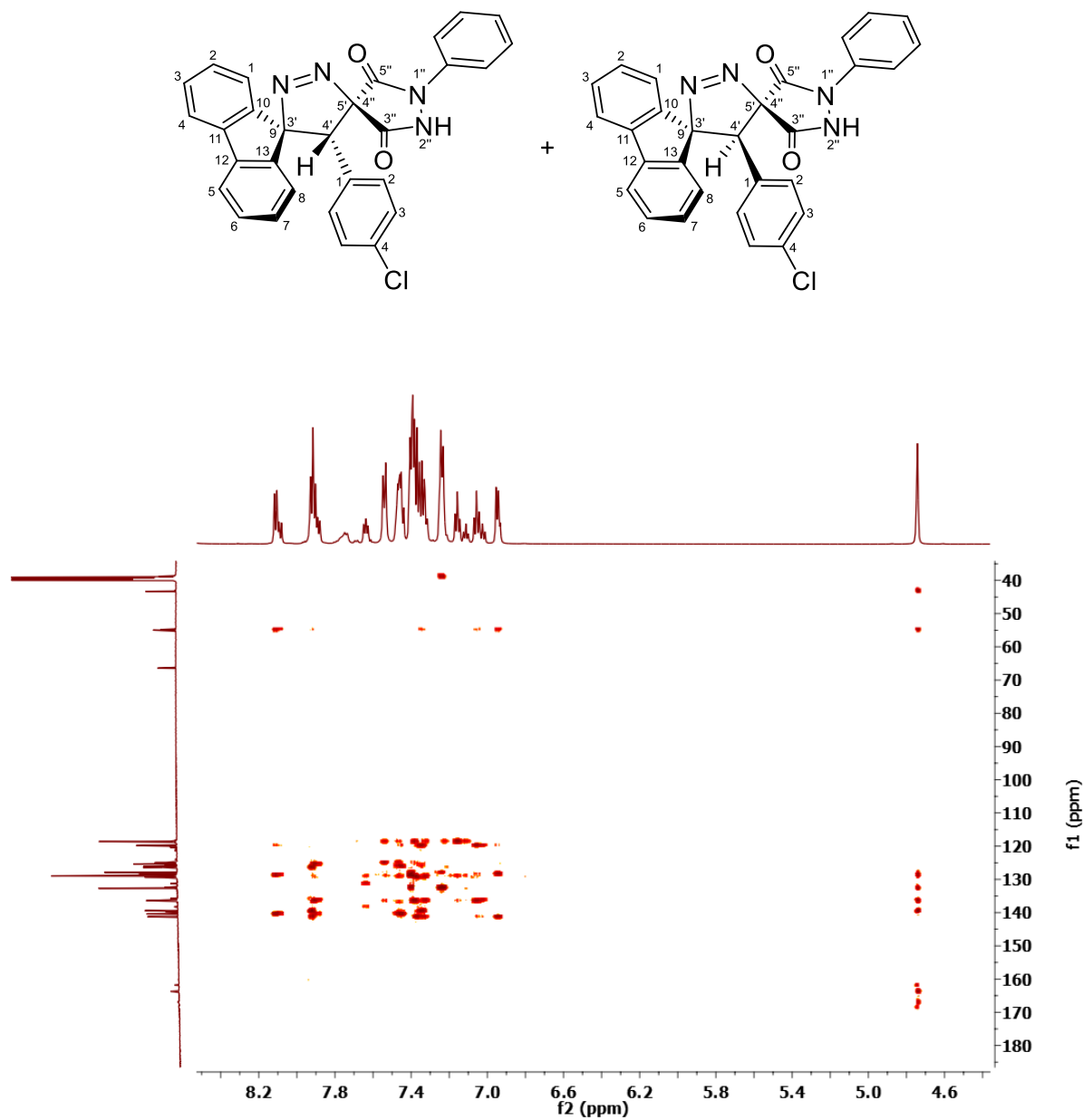
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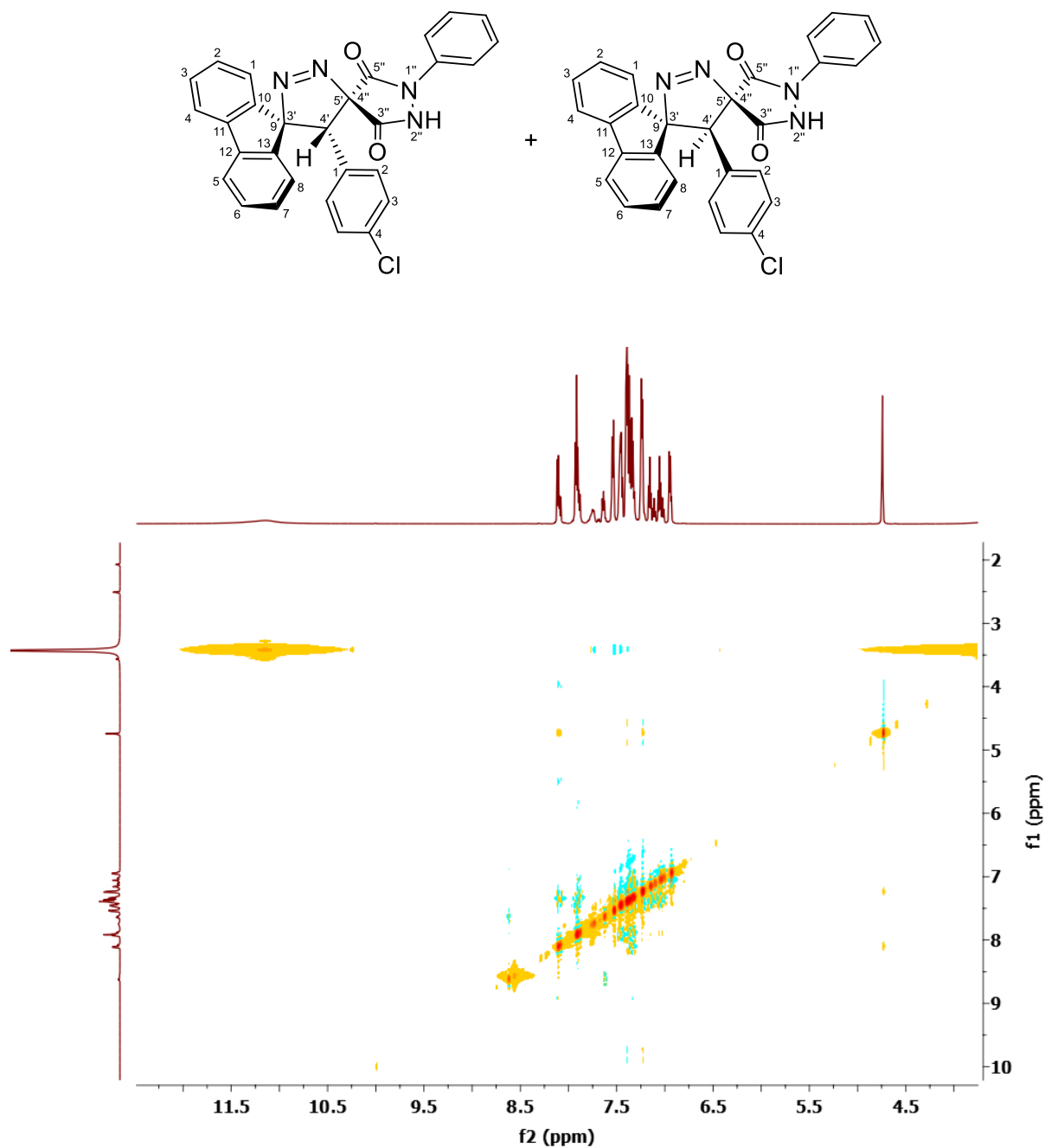
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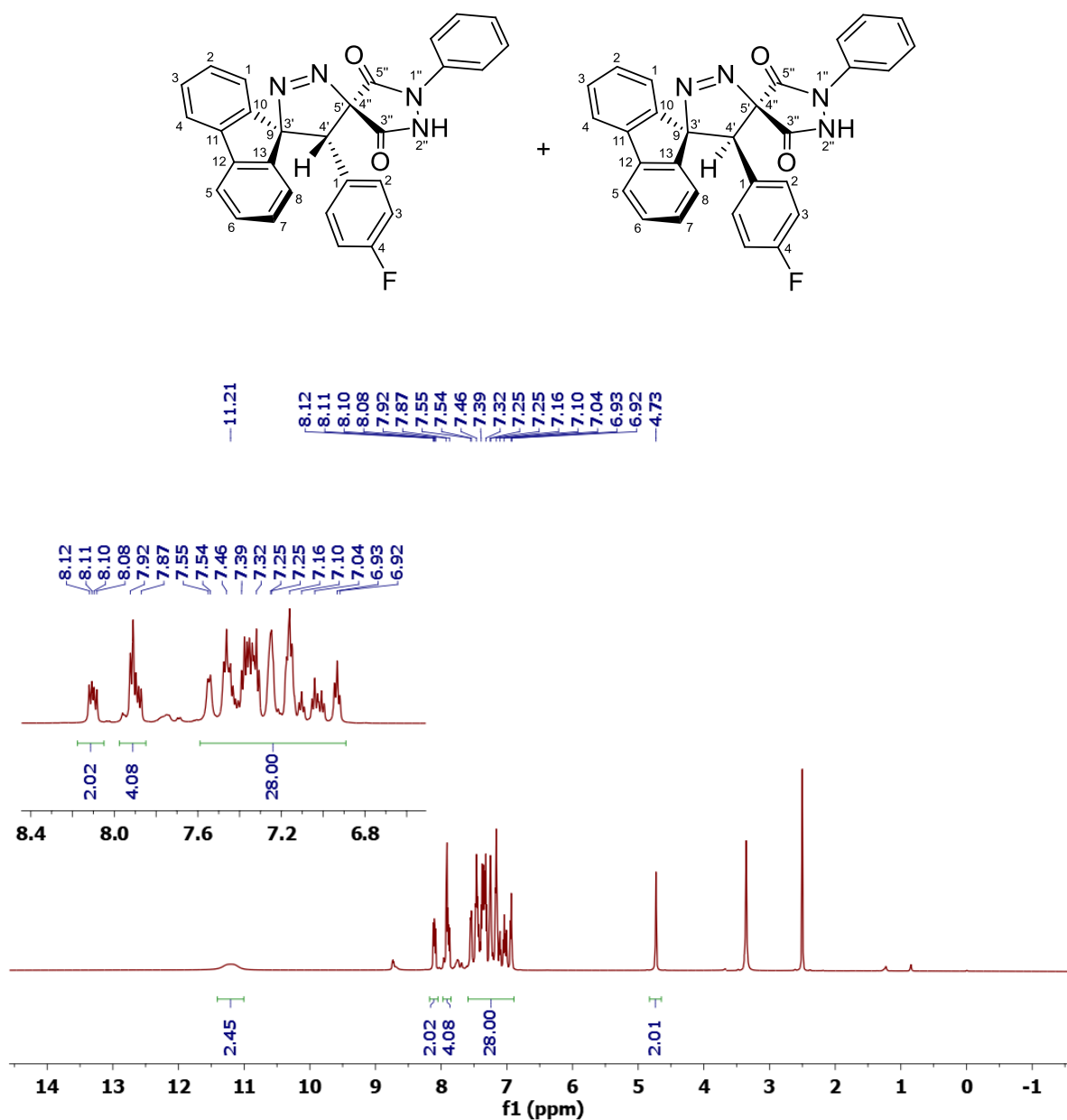
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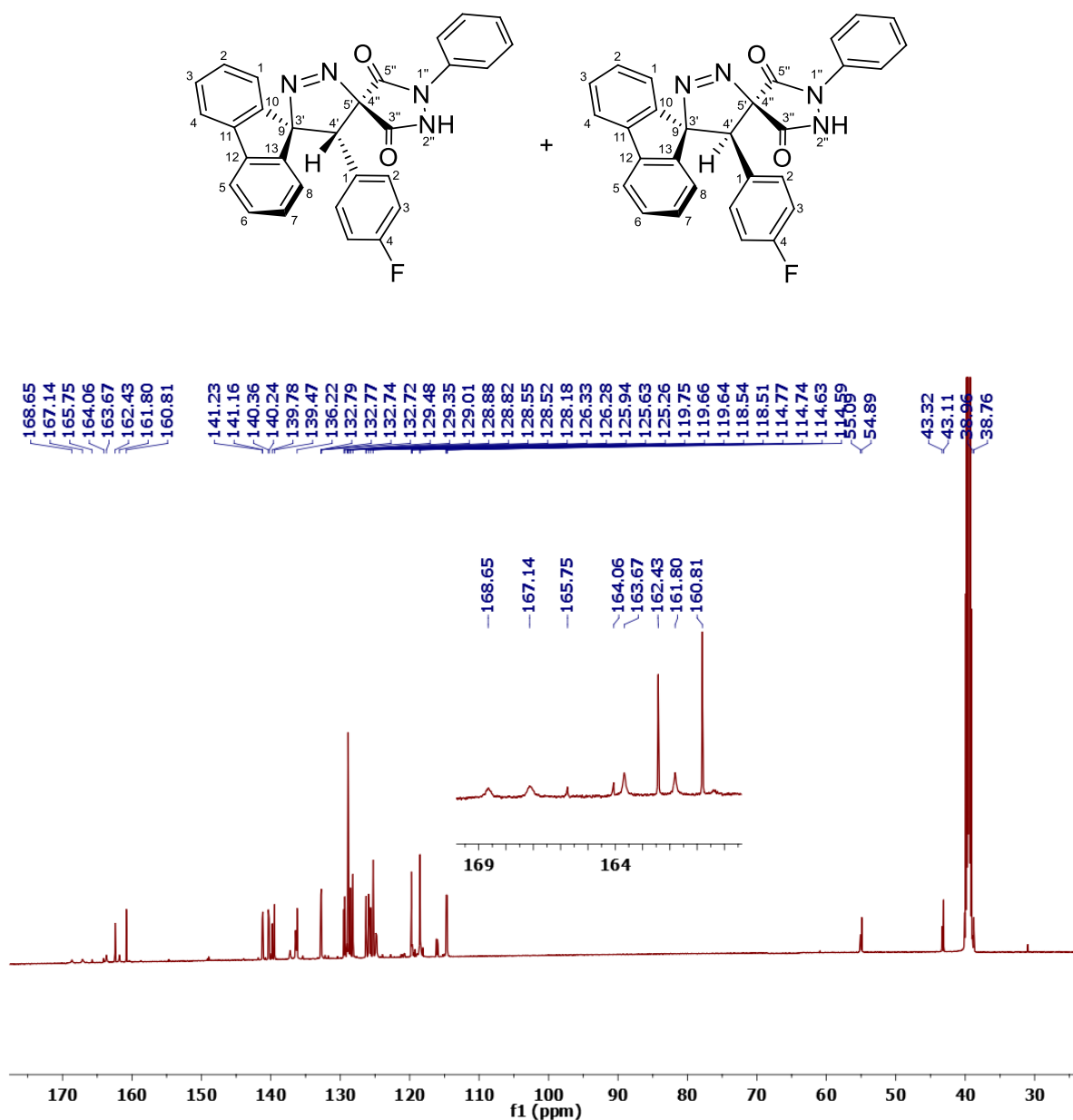
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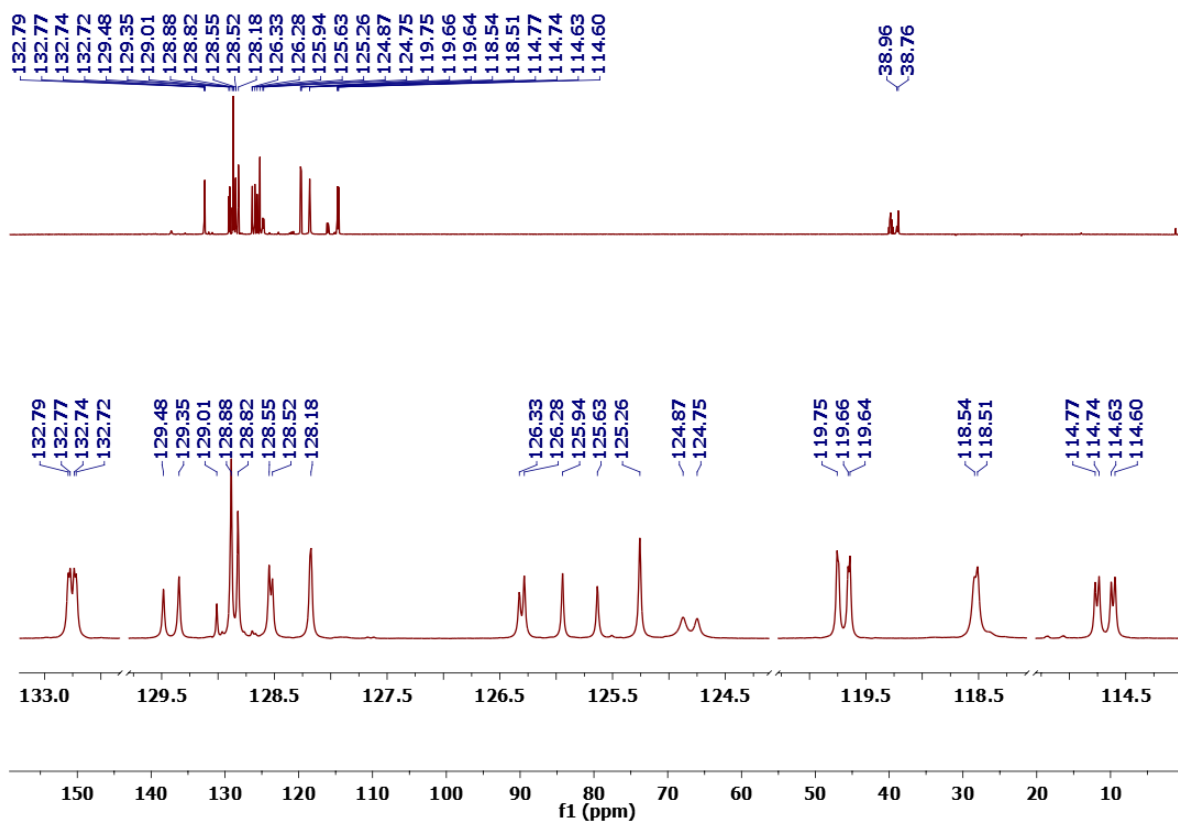
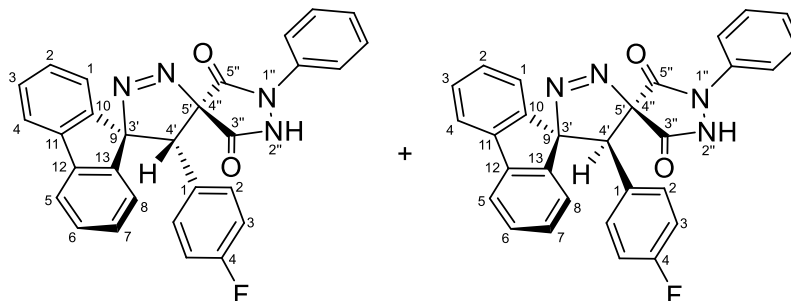
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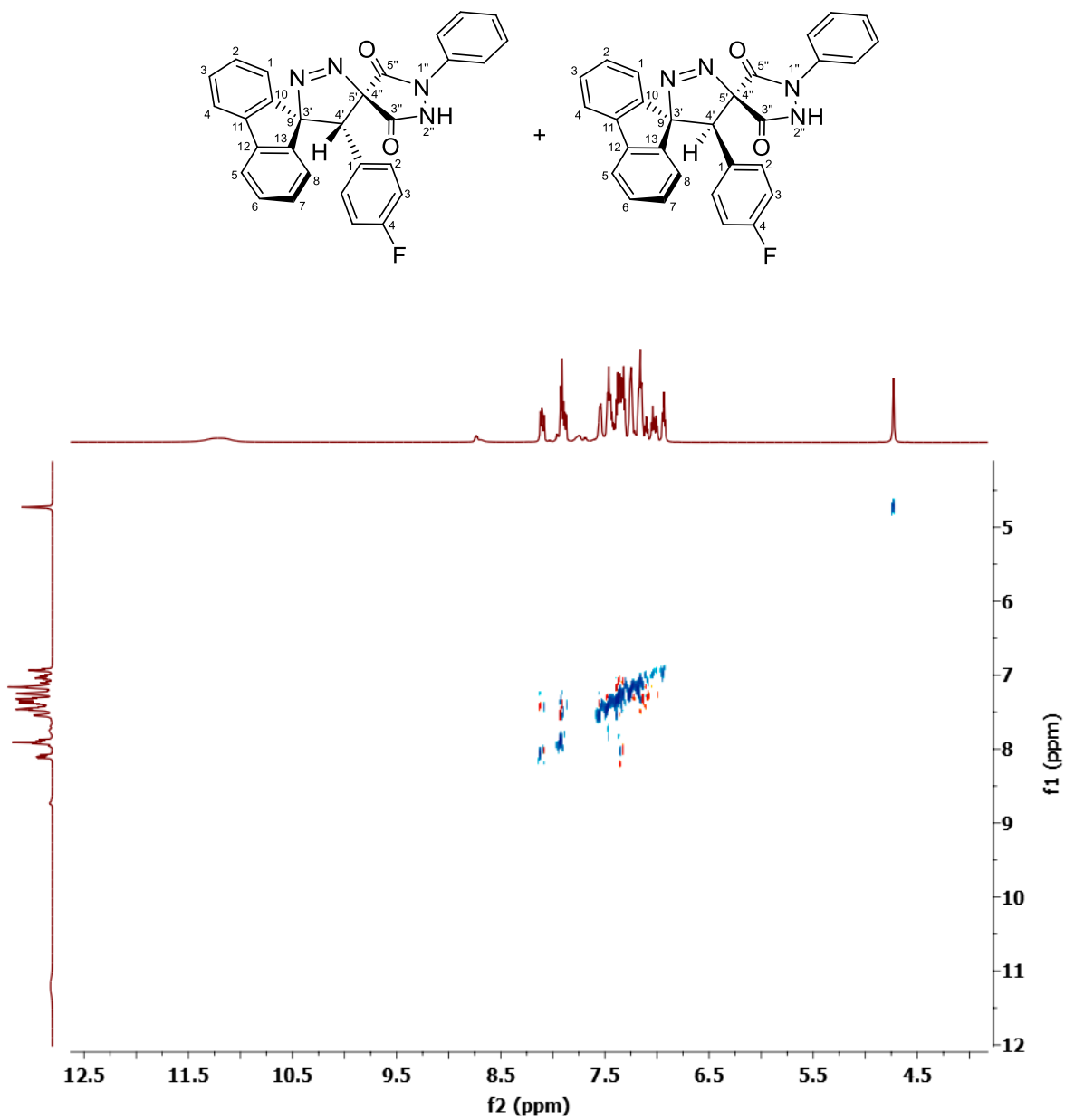
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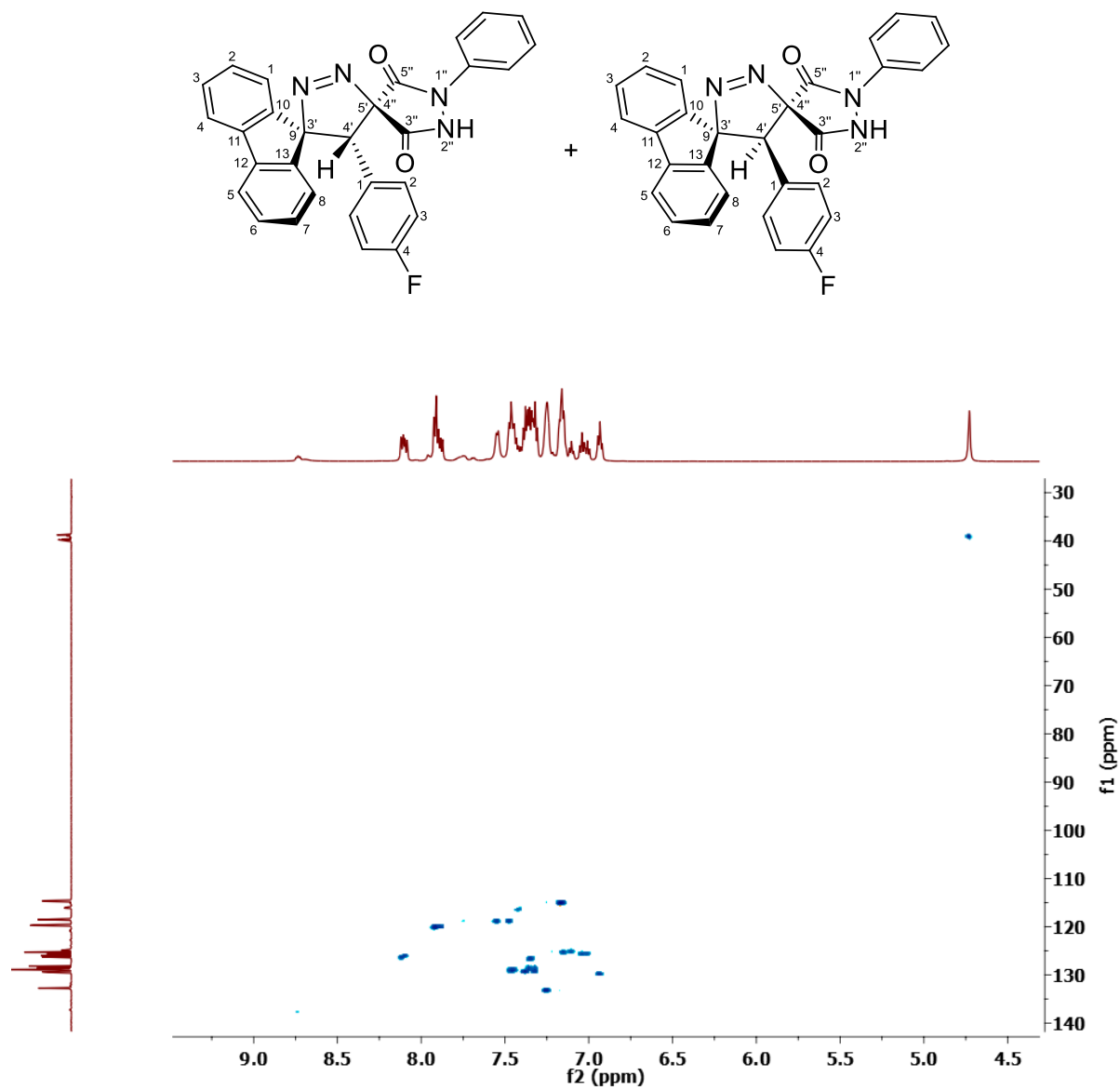
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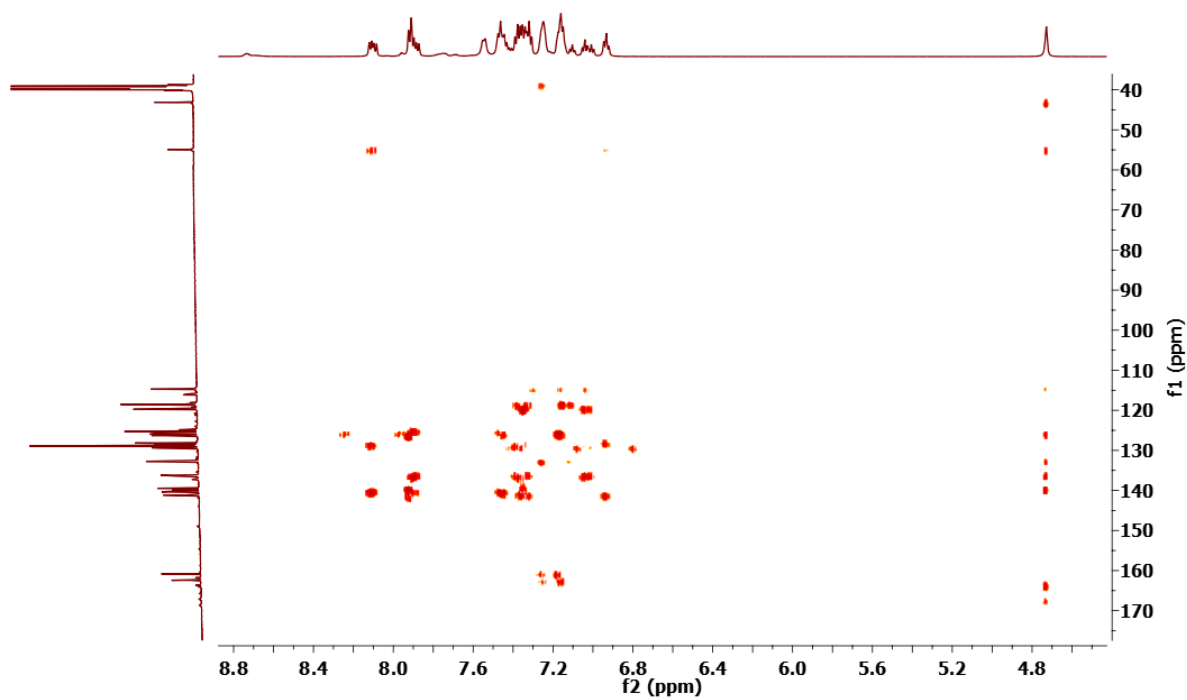
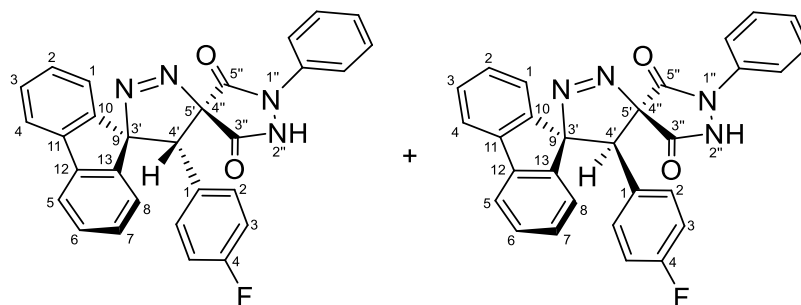
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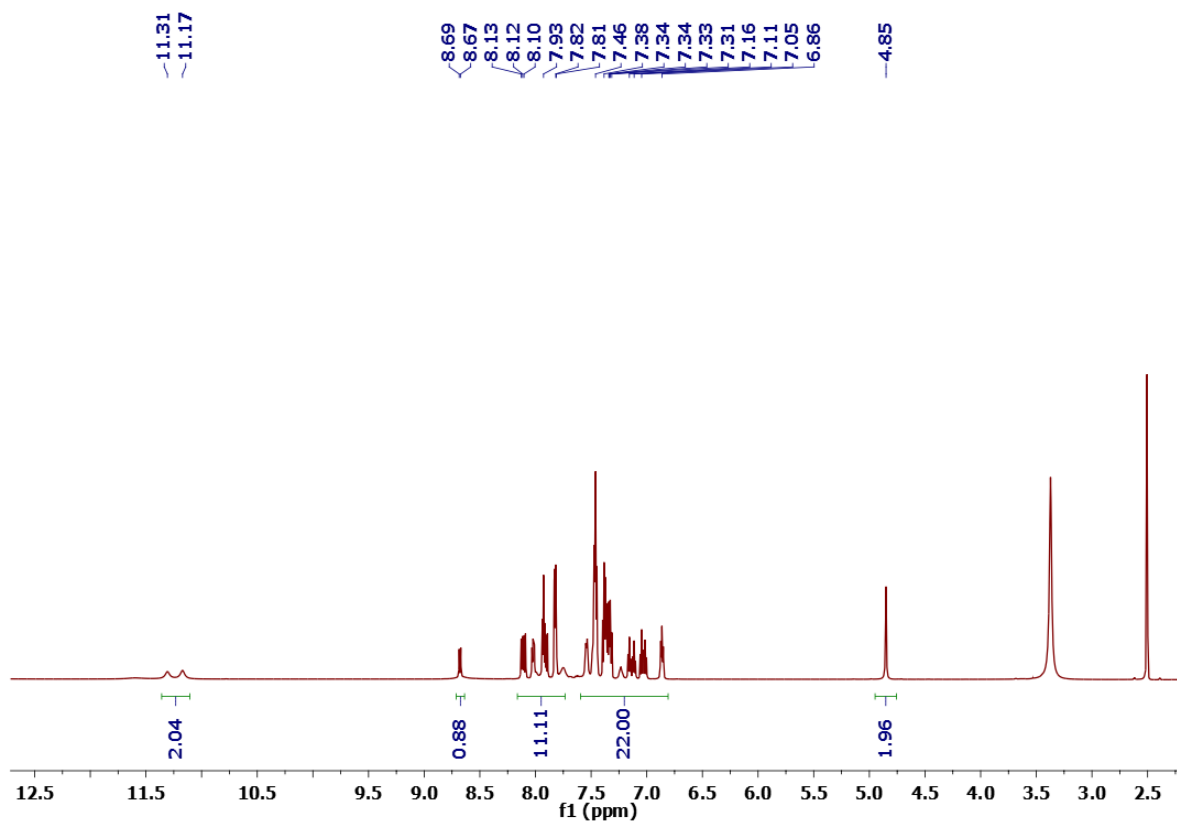
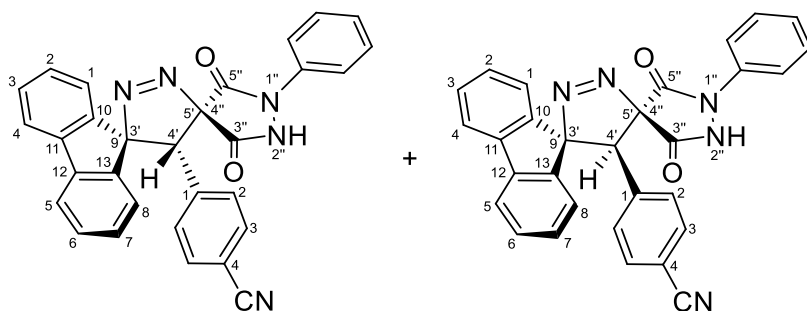
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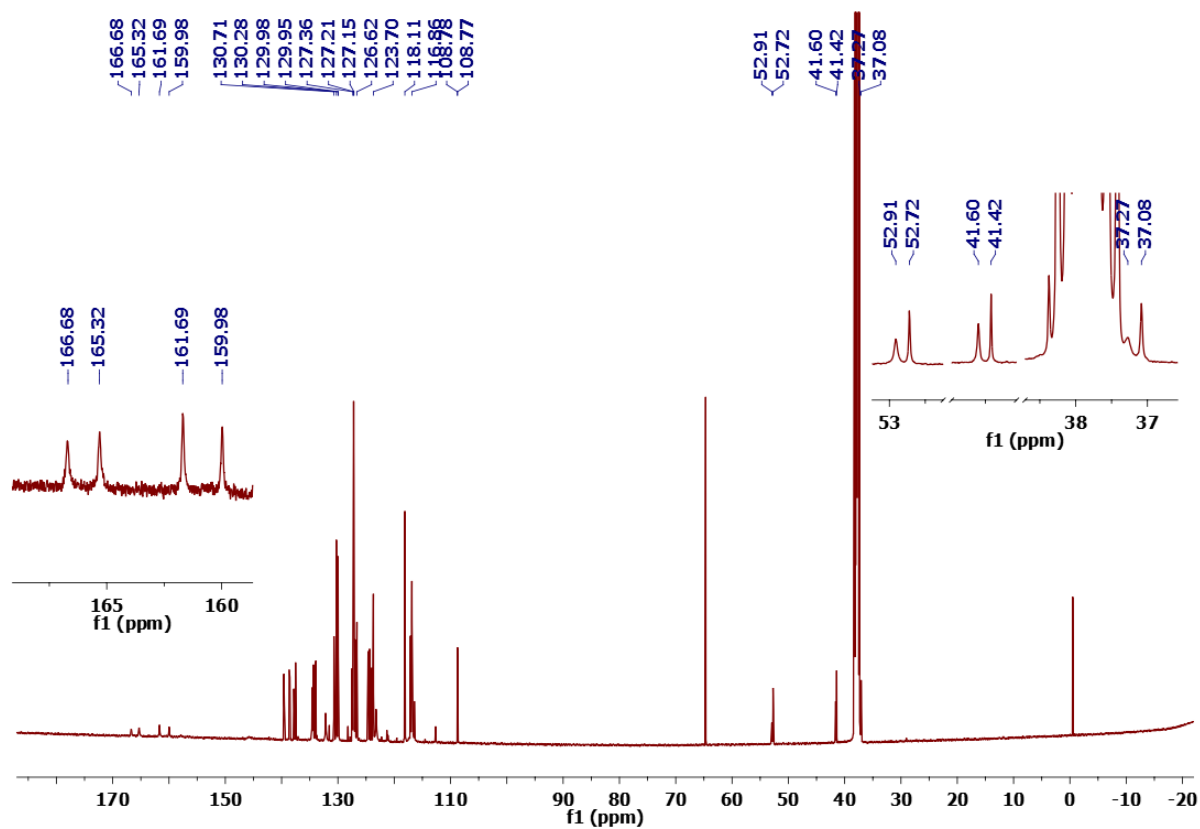
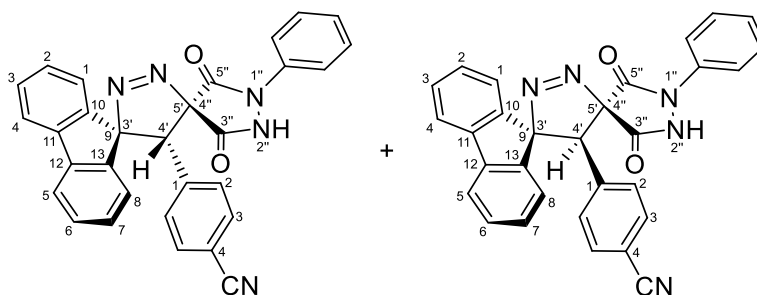
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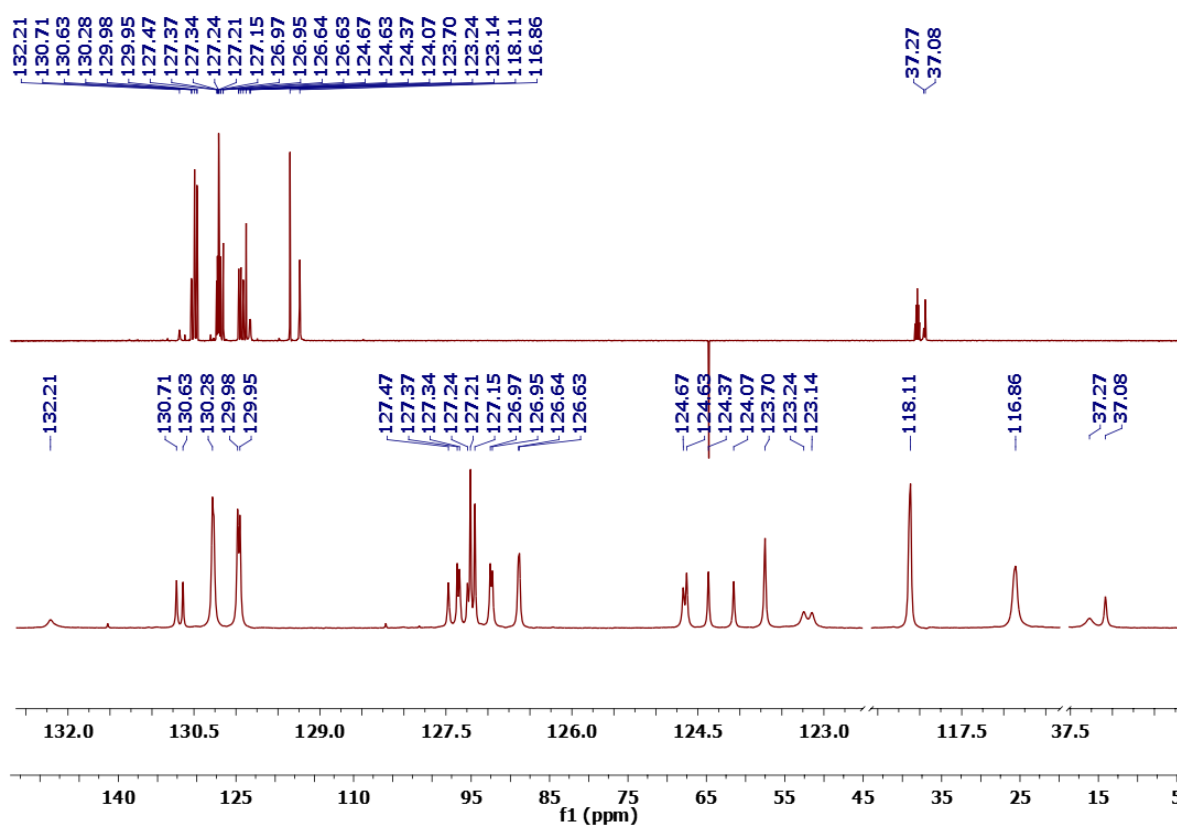
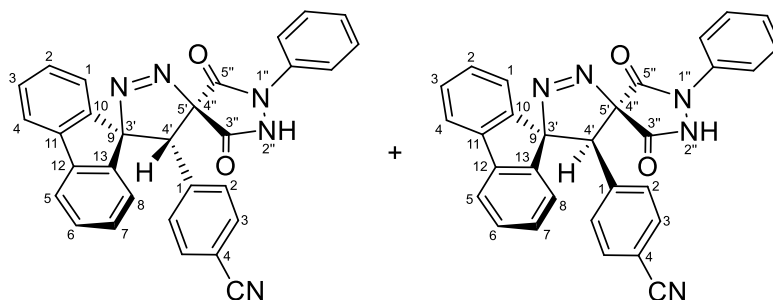
¹H NMR spectrum of (4'R,5'R)-4'-(4-cyanophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5f) and (4'S,5'R)-4'-(4-cyanophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5f')



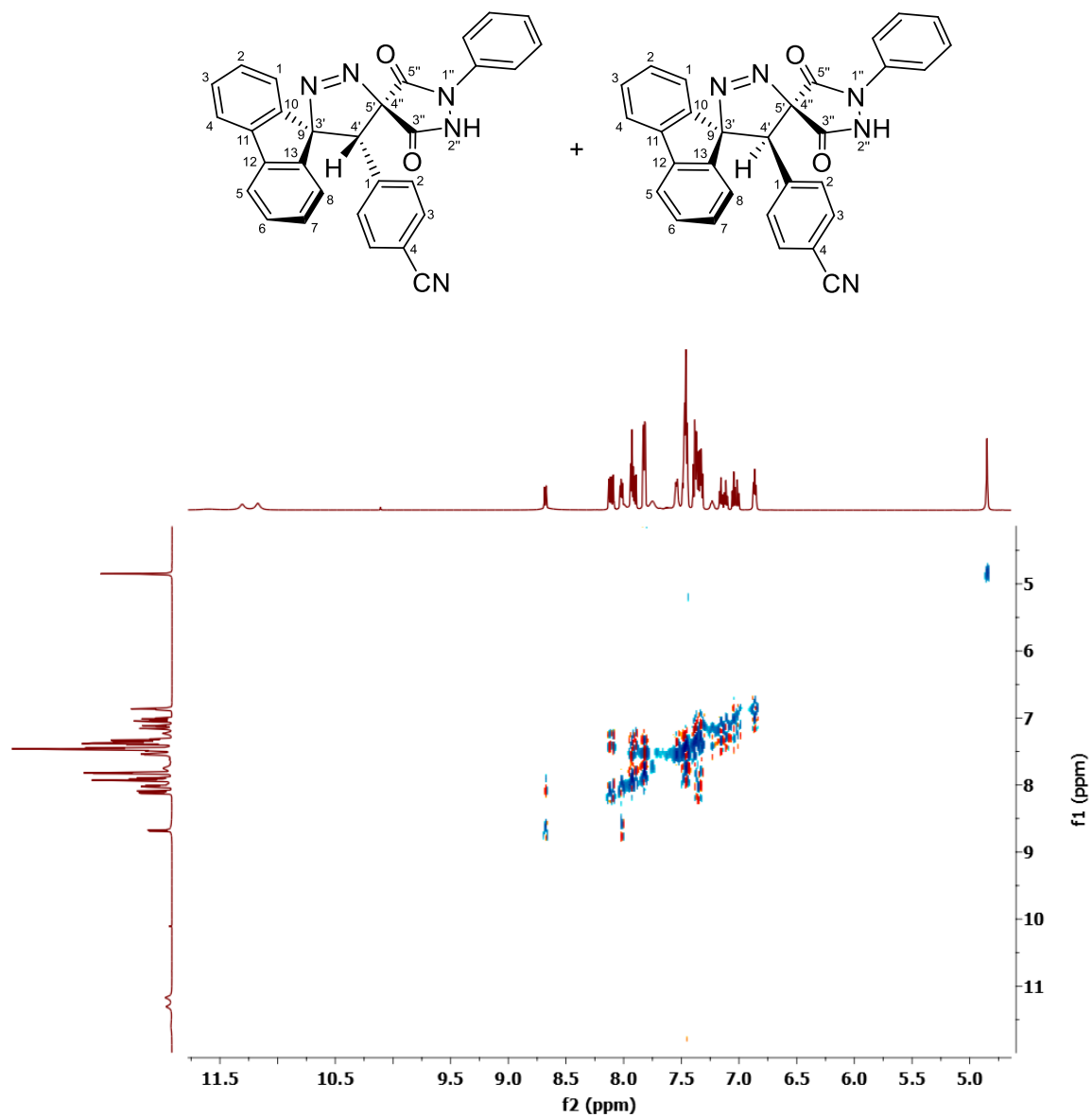
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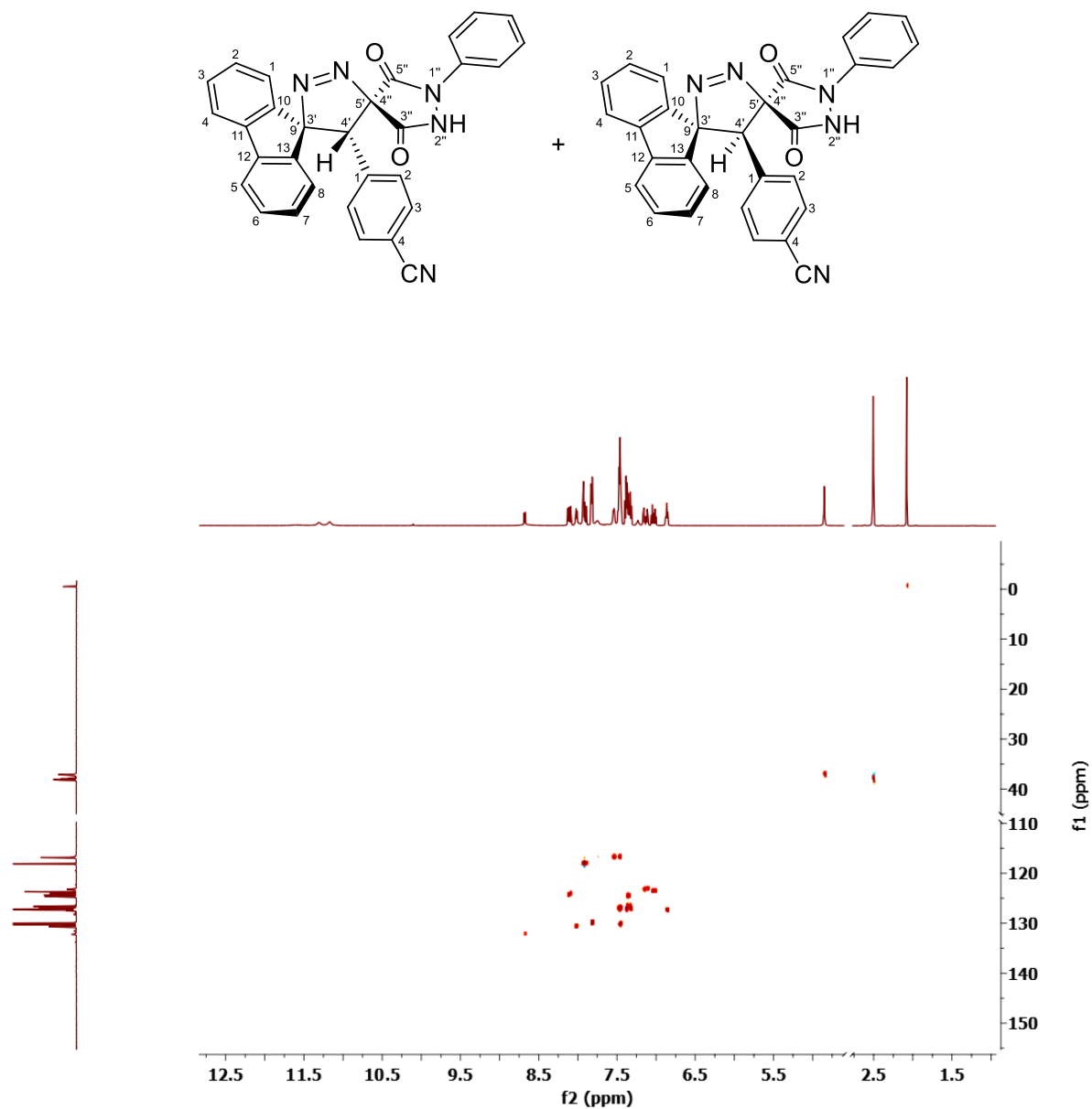
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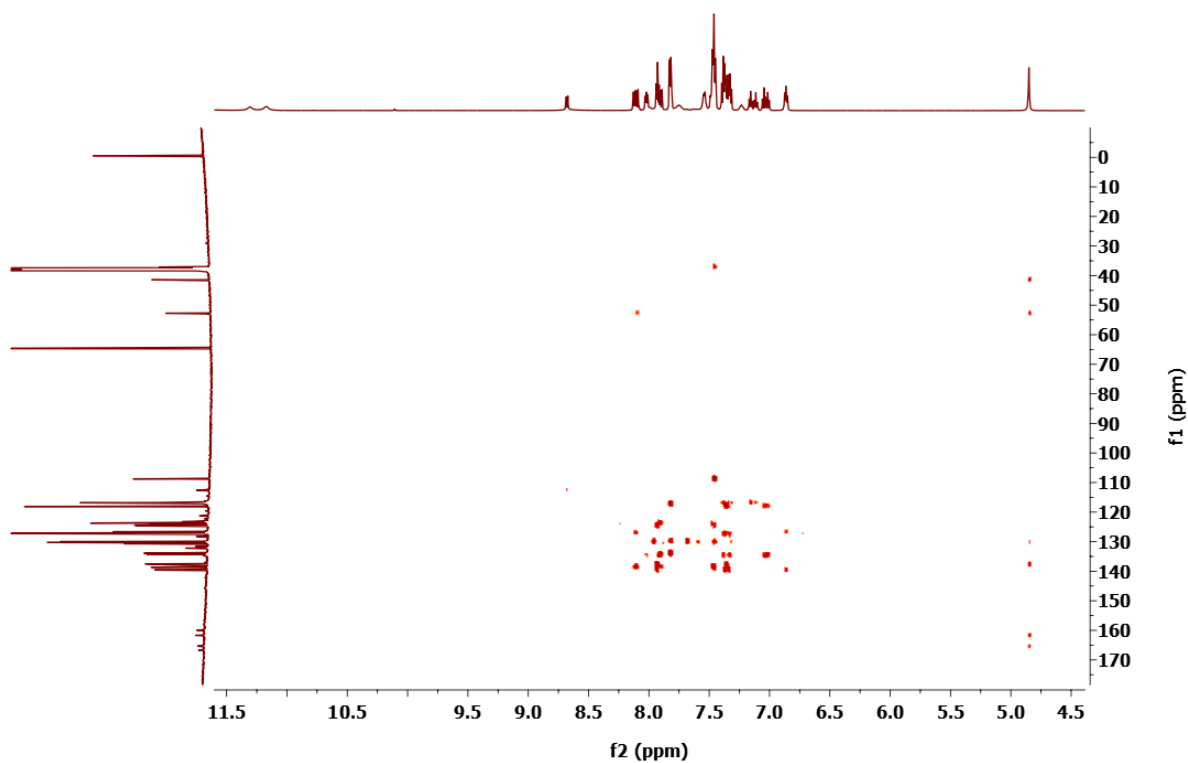
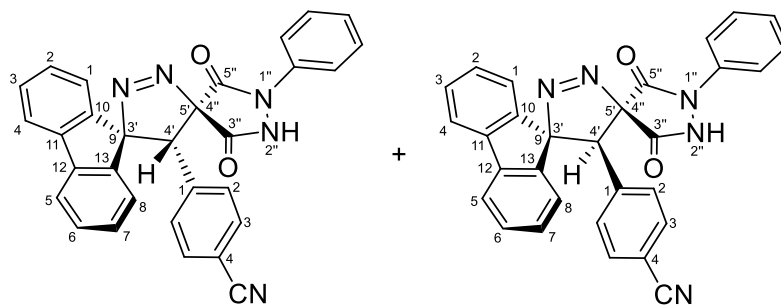
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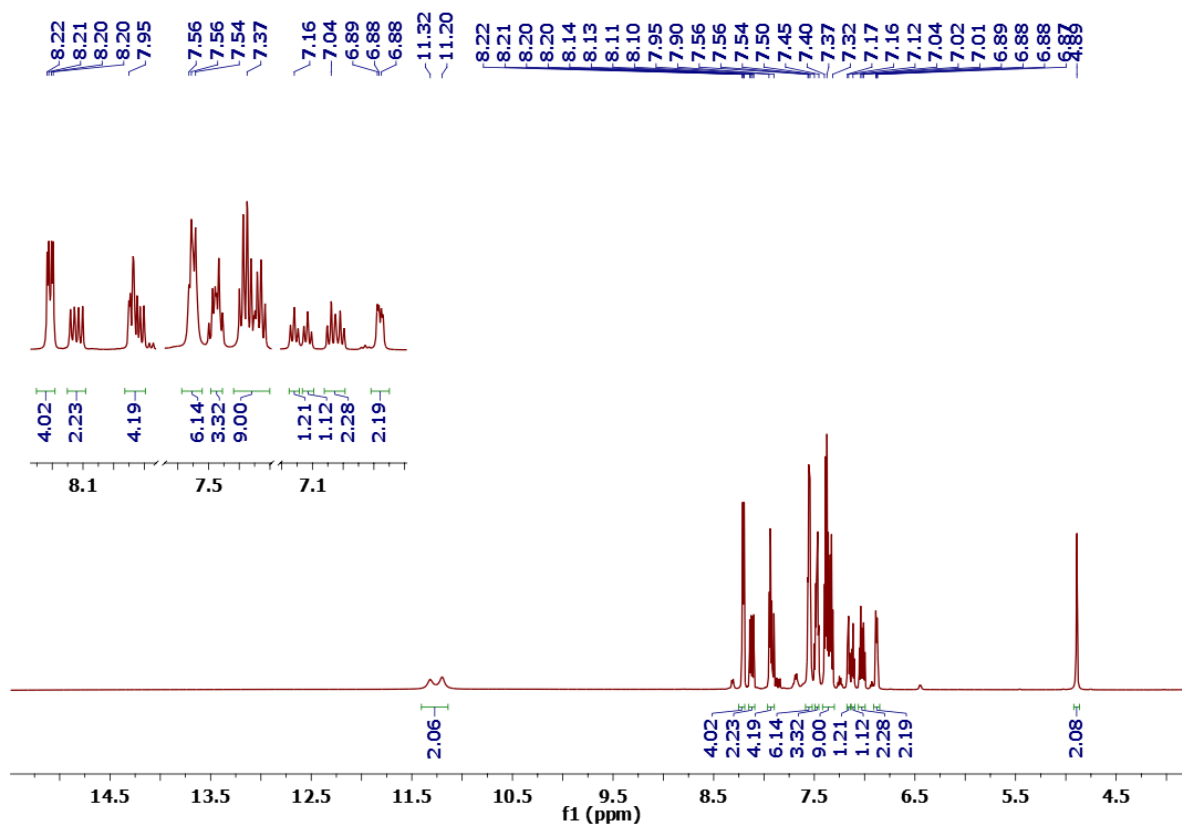
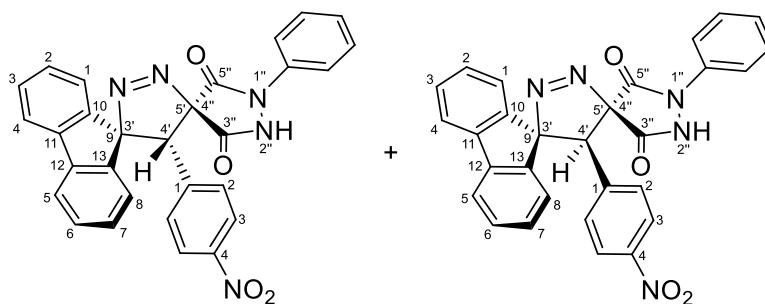
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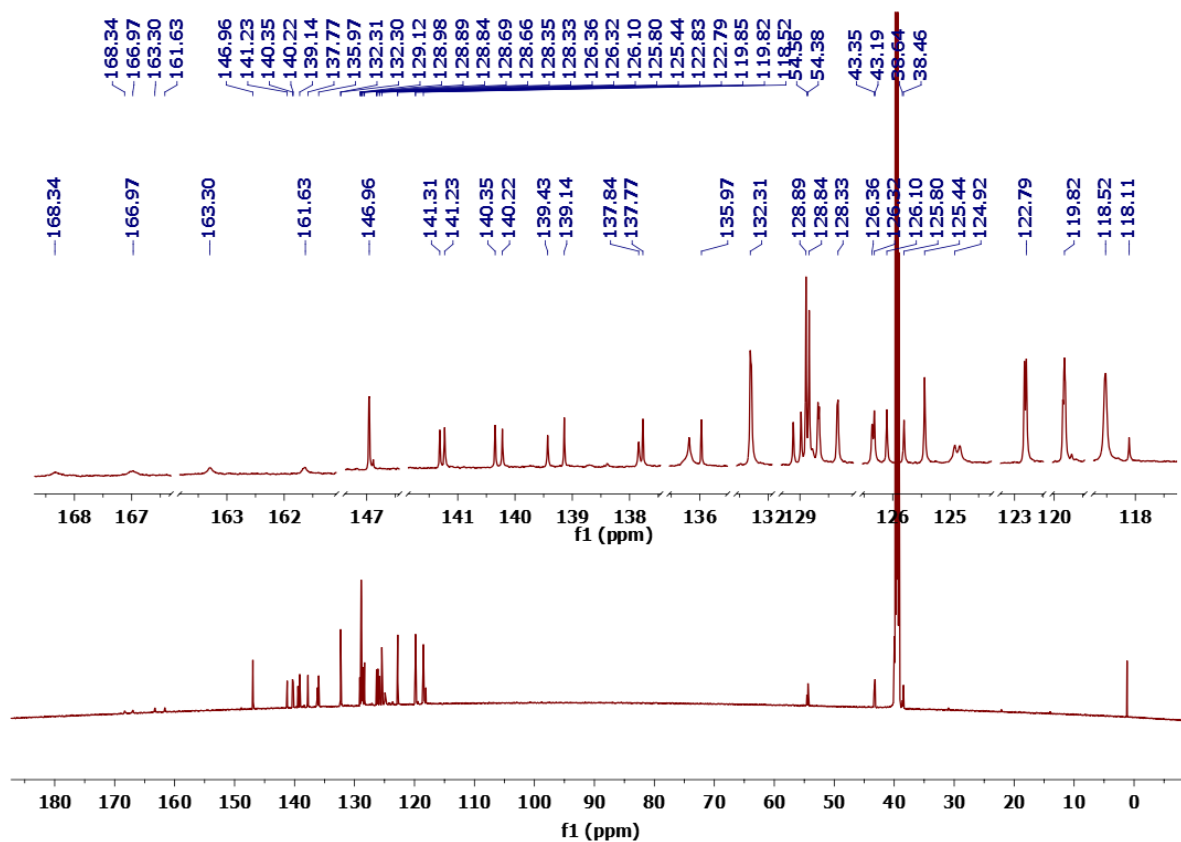
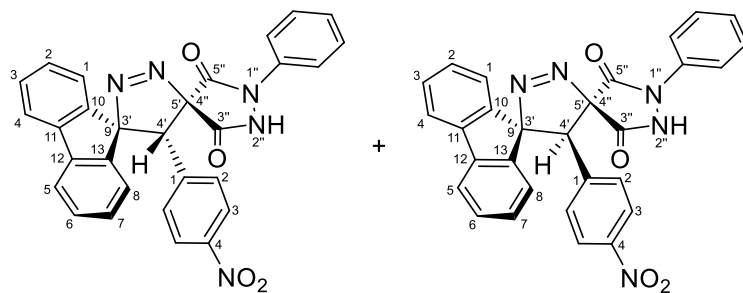
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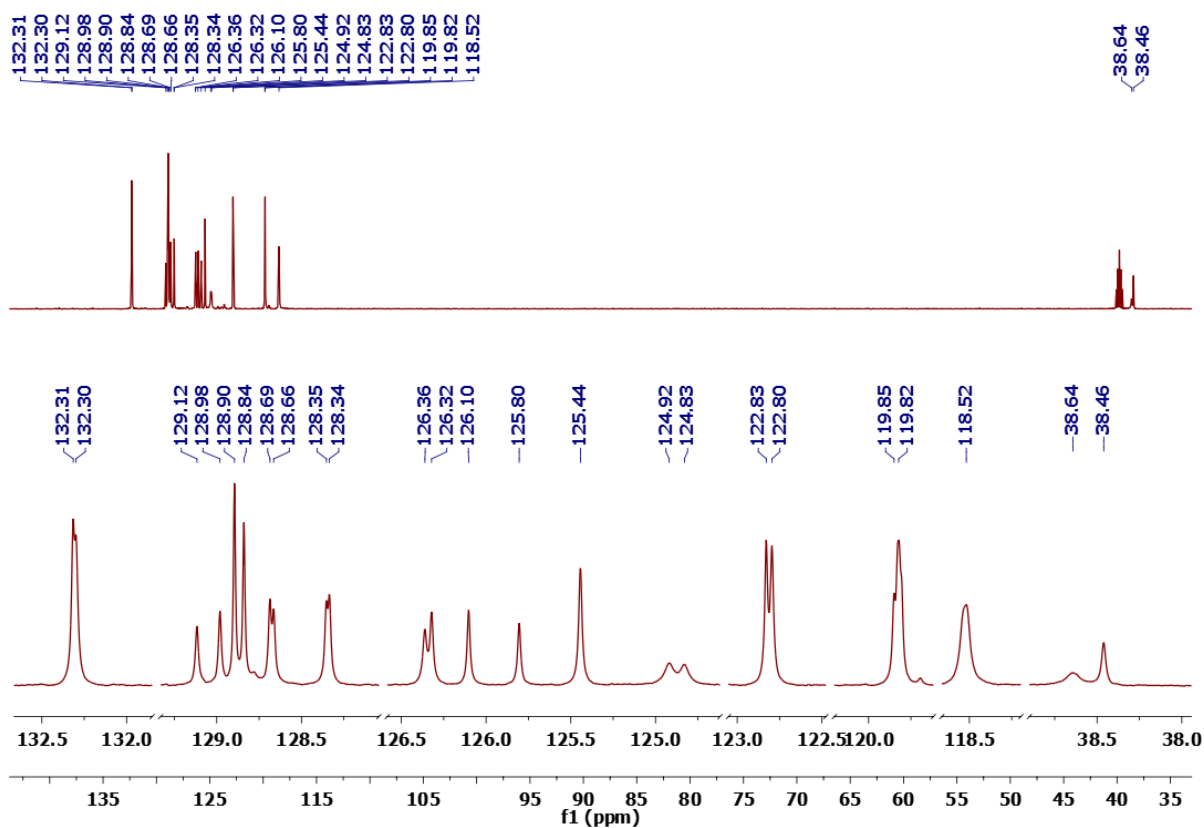
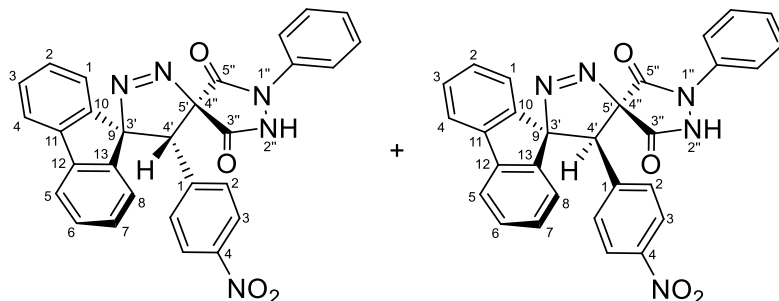
¹H NMR spectrum of (4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)



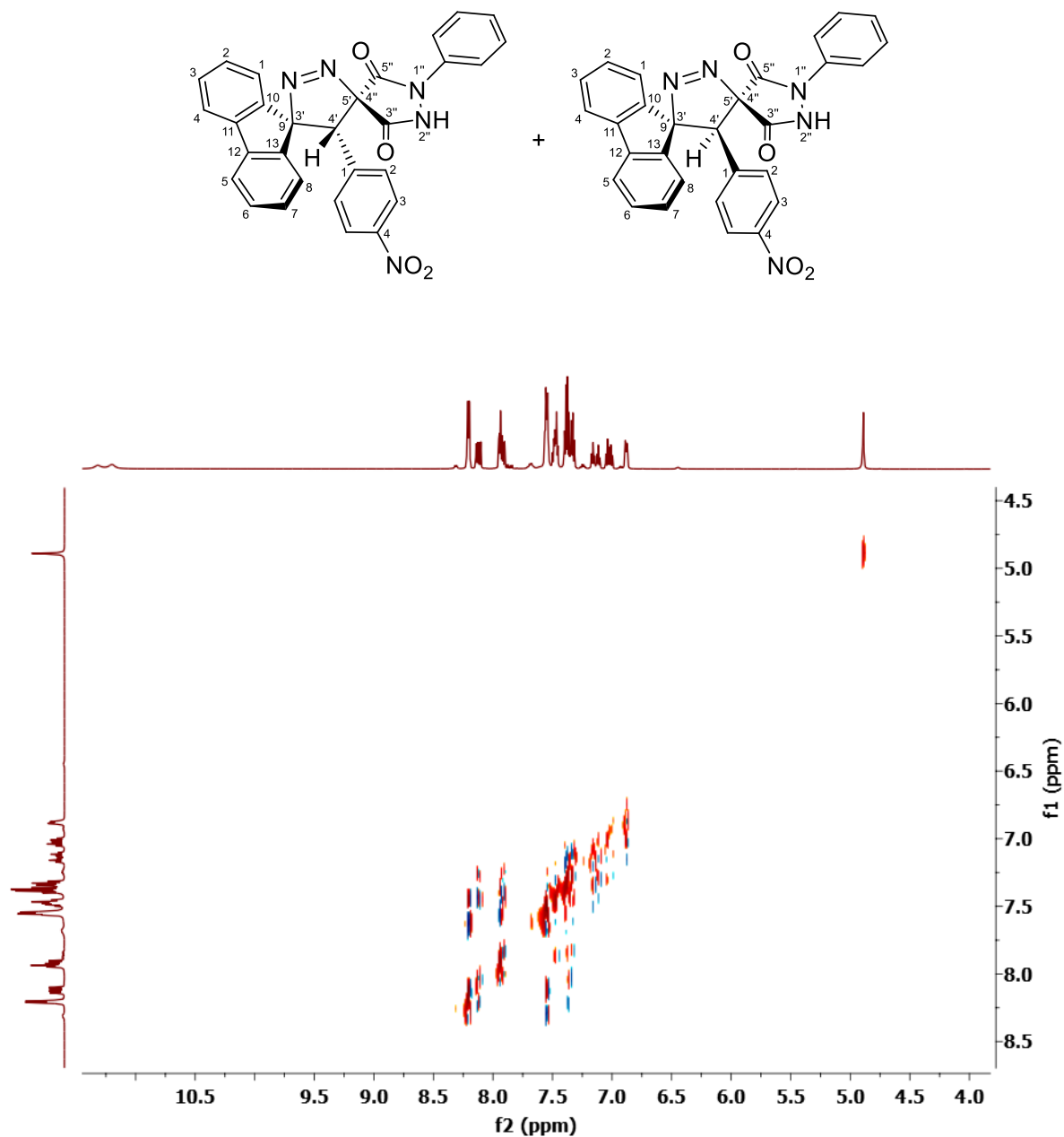
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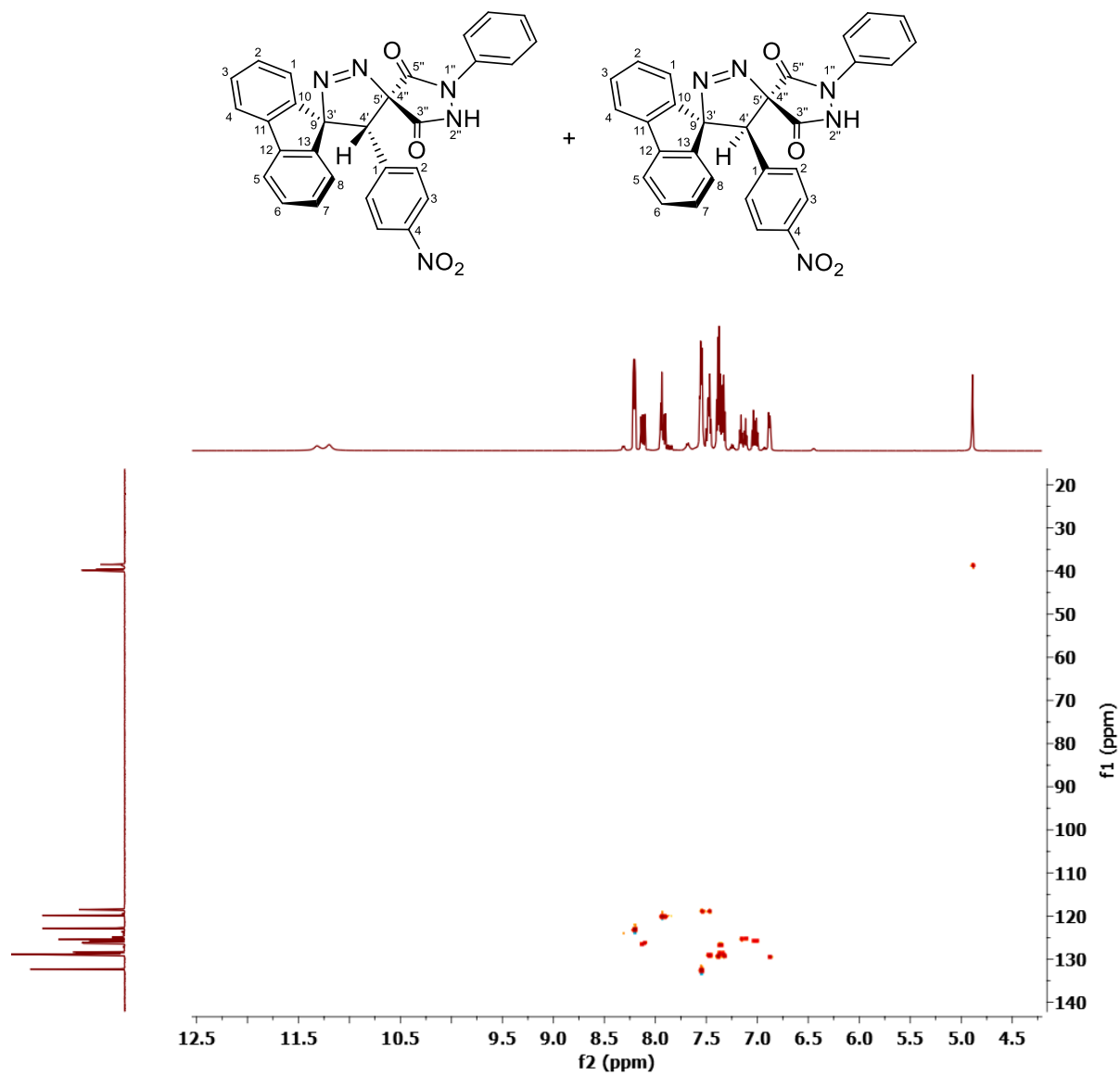
^{13}C DEPT-135 NMR spectrum of (4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)



^1H - ^1H gDQCOSY NMR spectrum of (4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)



^1H - ^{13}C -HSQC NMR spectrum of (4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'S'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)



^1H - ^{13}C -gHMBC NMR spectrum of (4'R,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5g) and (4'S,5'R)-4'-(4-nitrophenyl)-1''-phenyl-4'H-dispiro[fluorene-9,3'-pyrazole-5',4''-pyrazolidine]-3'',5''-dione (5'g)

