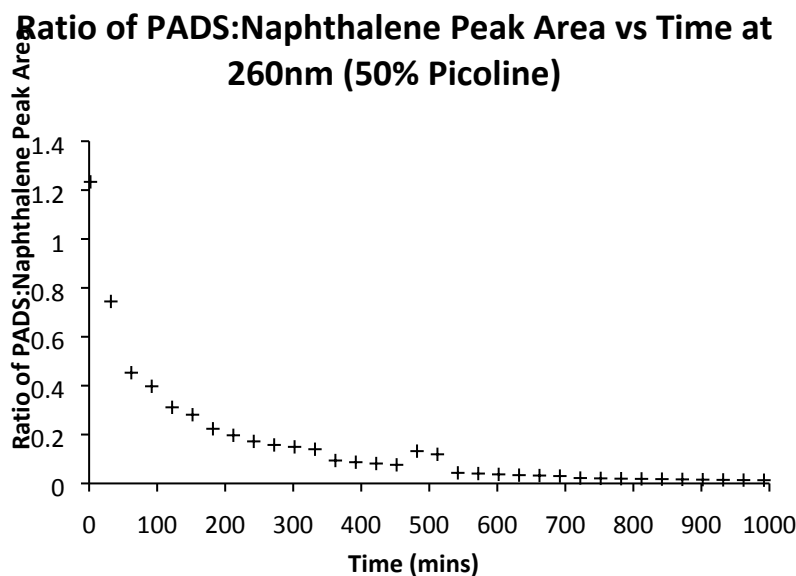


ELECTRONIC SUPPLEMENTARY INFORMATION

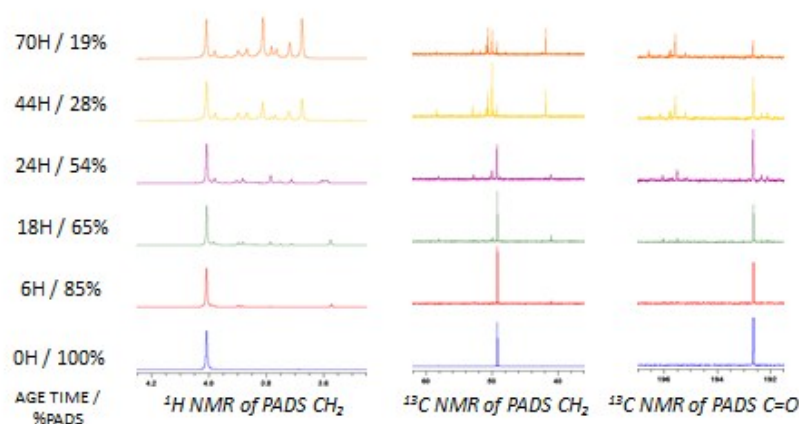
Phosphorothioate Anti-sense Oligonucleotides: The Kinetics and Mechanism of the Generation of the Sulfurising Agent from Phenylacetyl Disulfide (PADS)

James Scotson, Benjamin I. Andrews, Andrew P. Laws and Michael I. Page

1. Typical HPLC plot for the degradation of PADS at 25°C

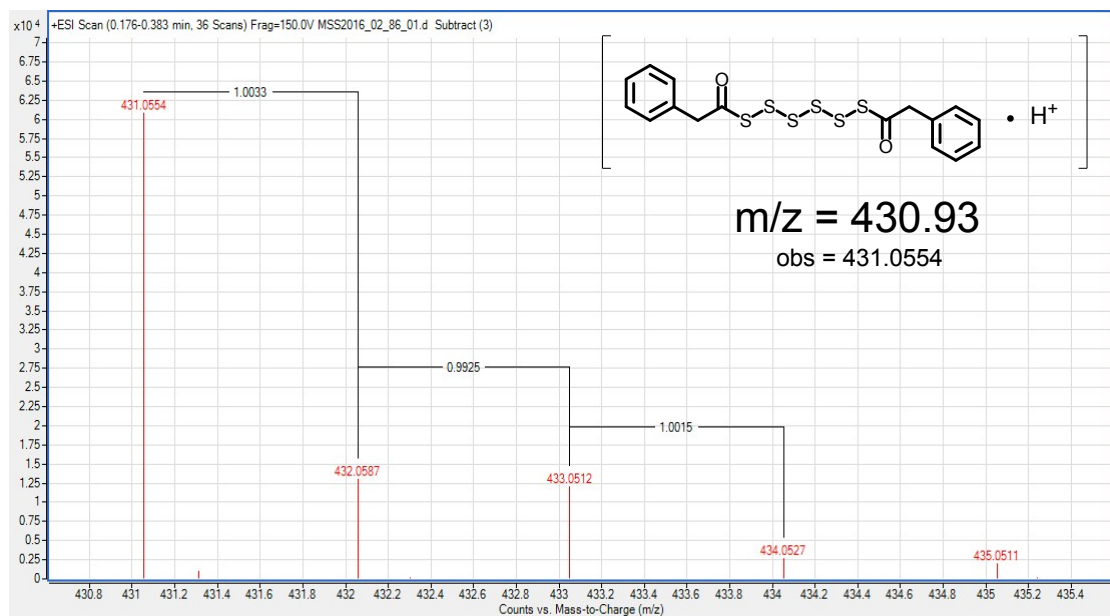
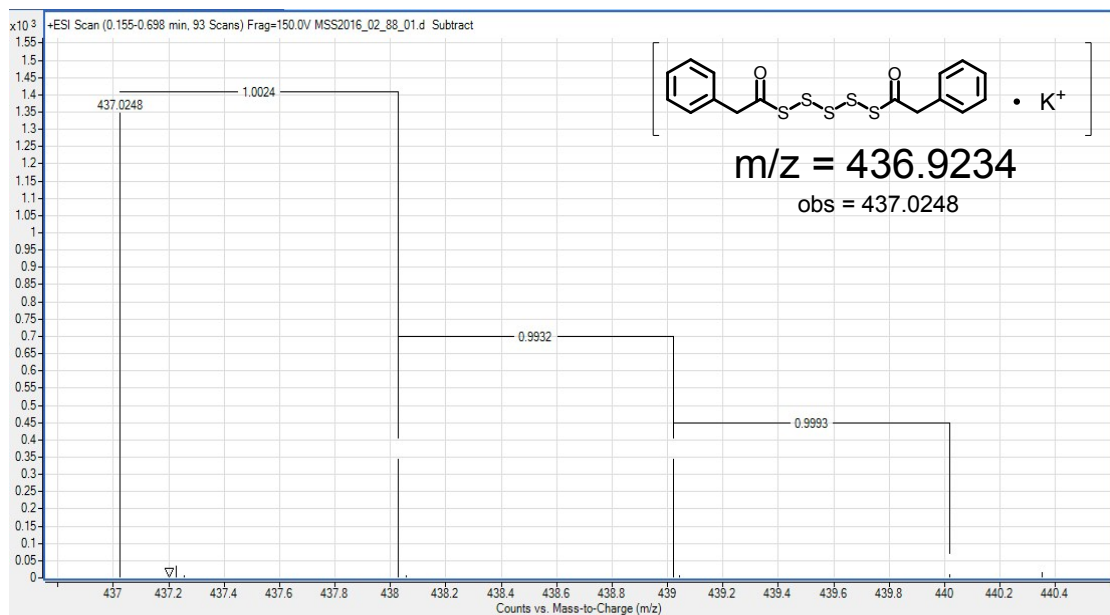
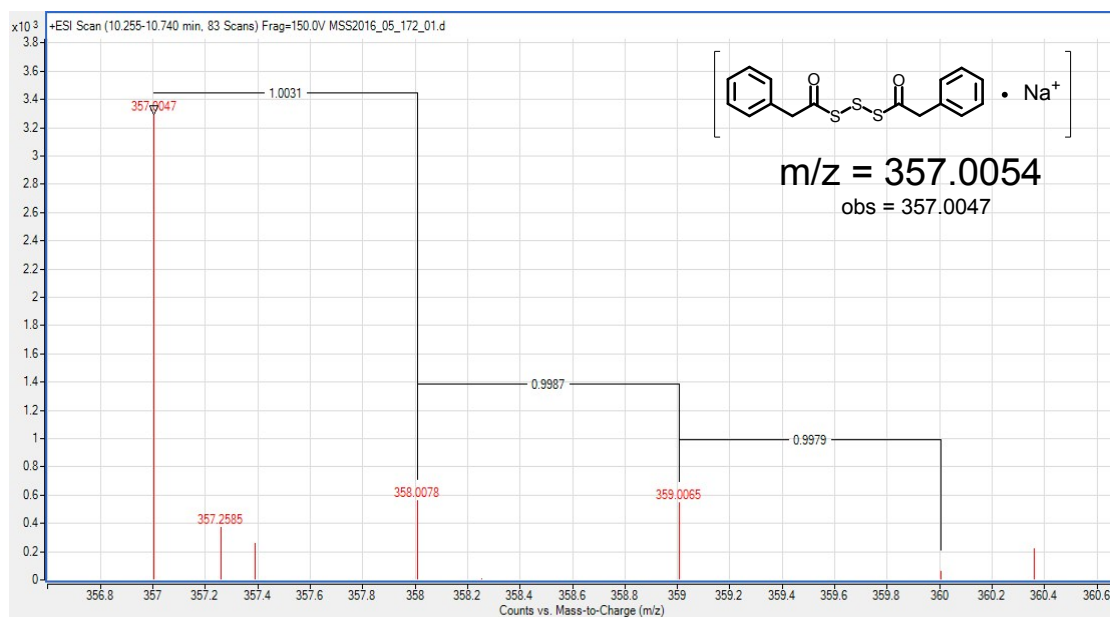


2. NMR spectral data for the degradation of PADS in 50% acetonitrile 3-picoline

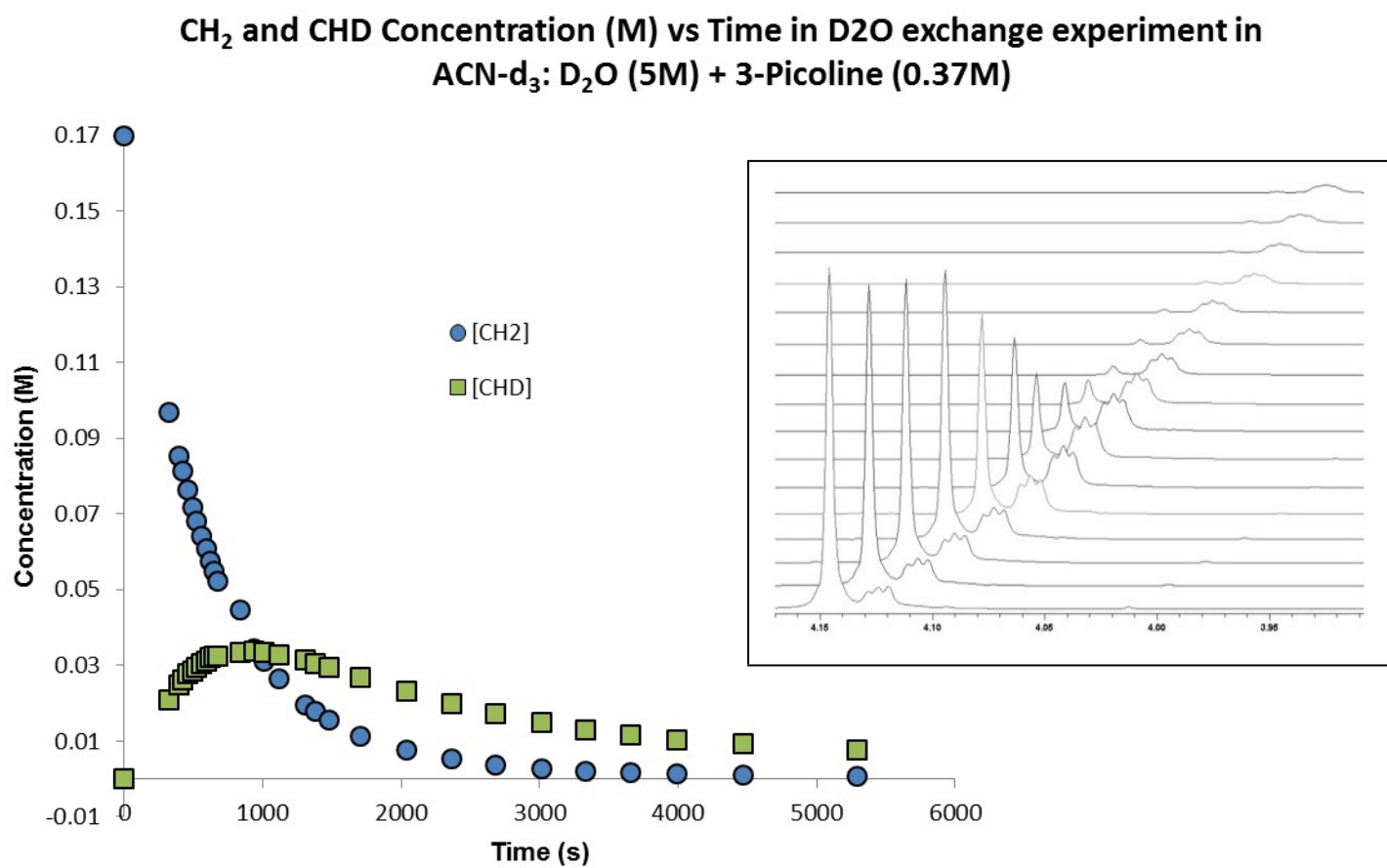


Samples prepared by quenching PADS solutions (0.2M) in 50% Picoline/ACN at T_{eq} with 2M HCl

3. Mass spec of phenylacetyl polysulfides



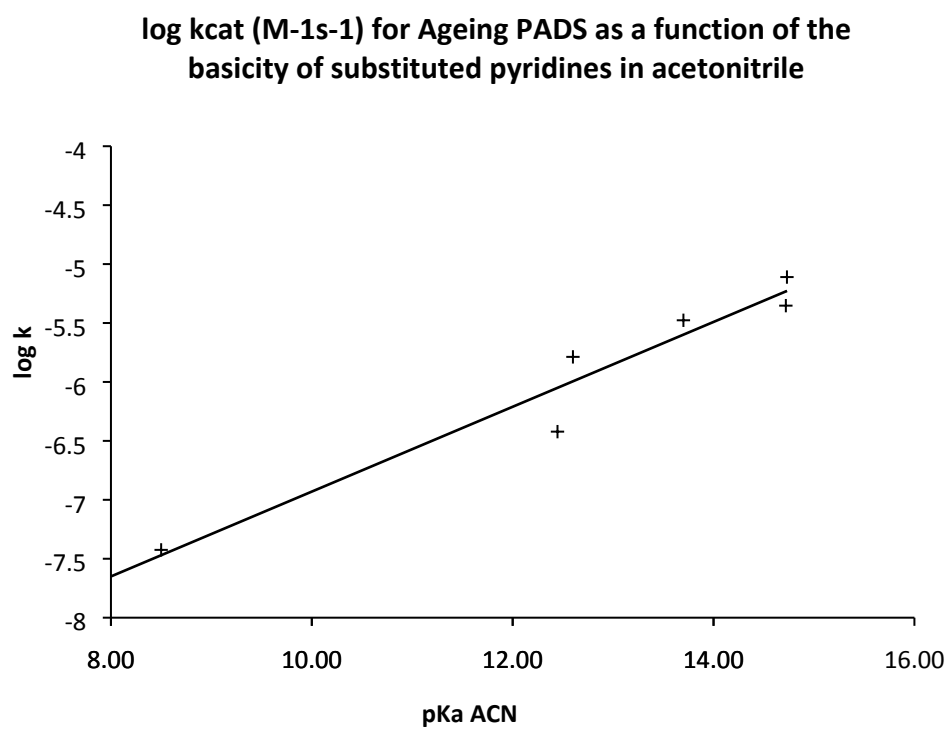
4. ^1H NMR time scans of 0.17M PADS, 0.35M 3-picoline 50 μL D_2O , 400 μL ACN-d_3



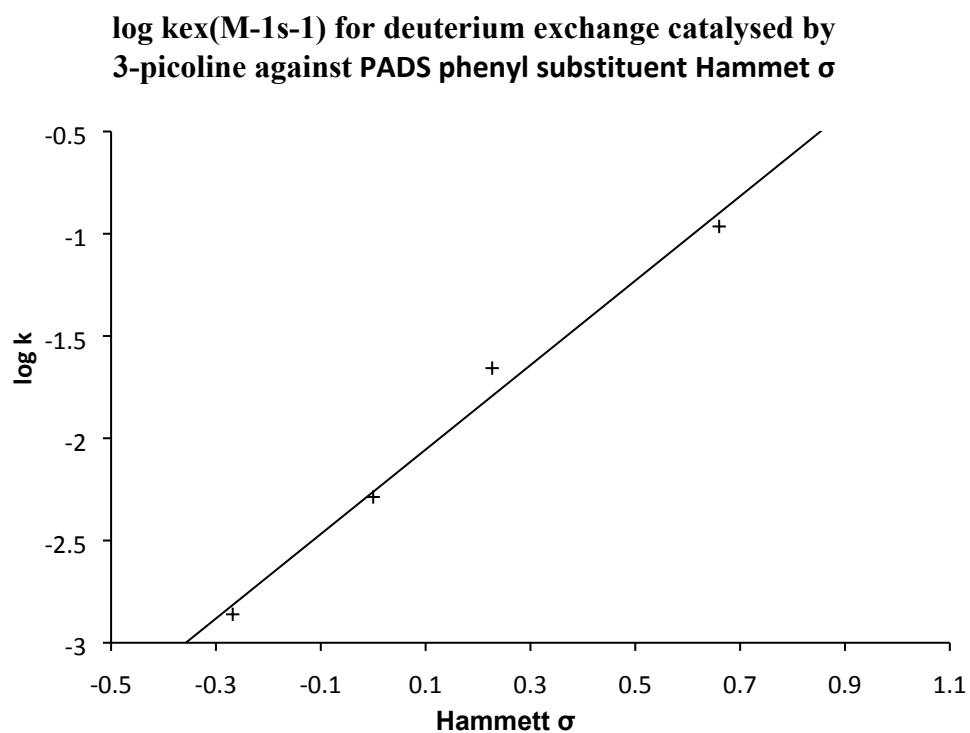
5. X-Ray Crystal structure of benzoyl disulfide



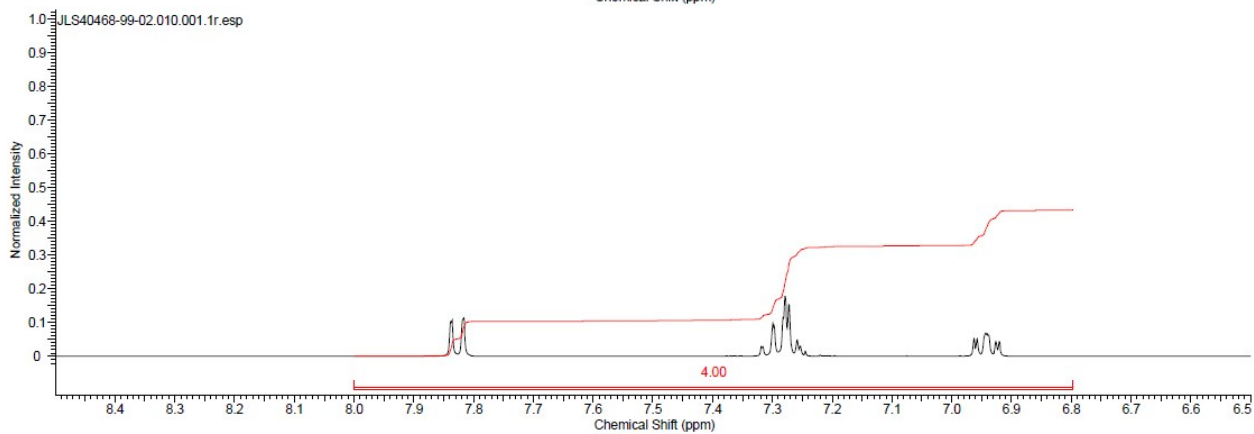
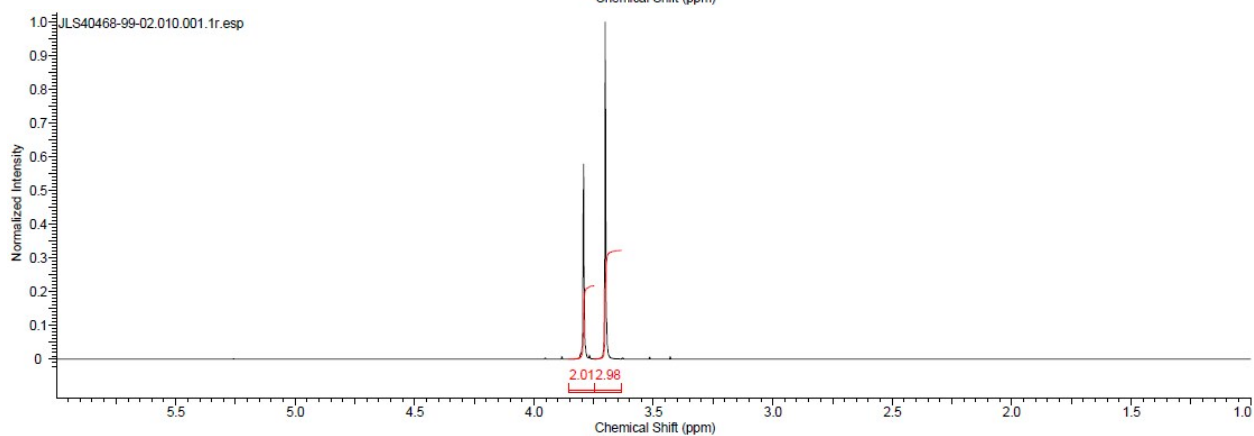
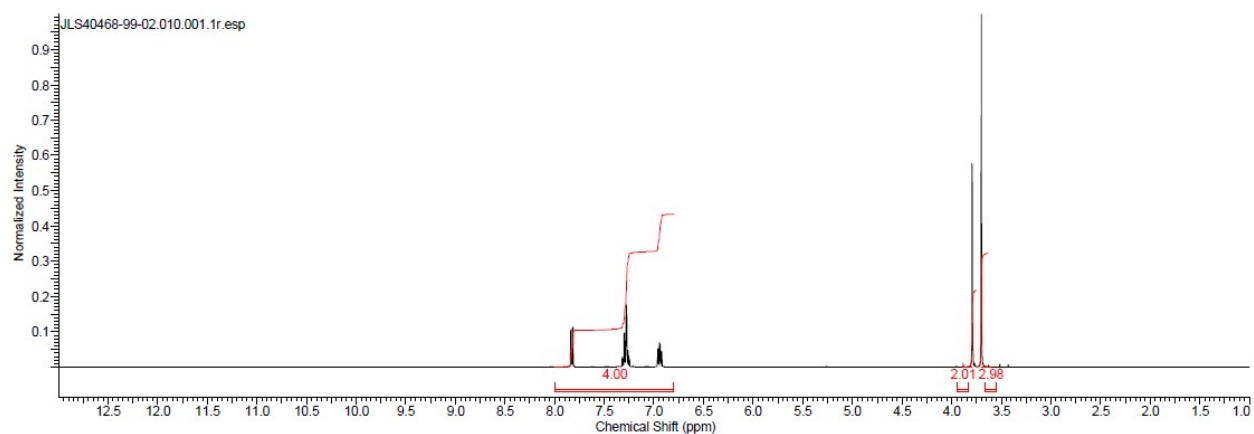
6. Graphical display of data provided in **Table 1**

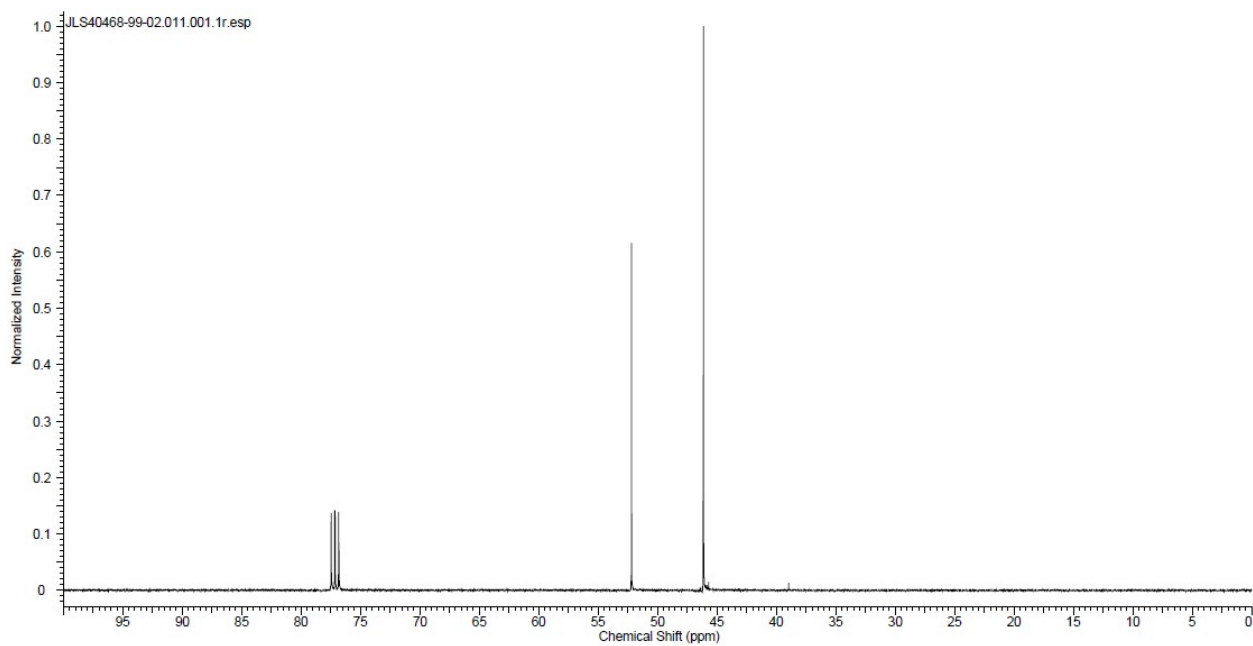
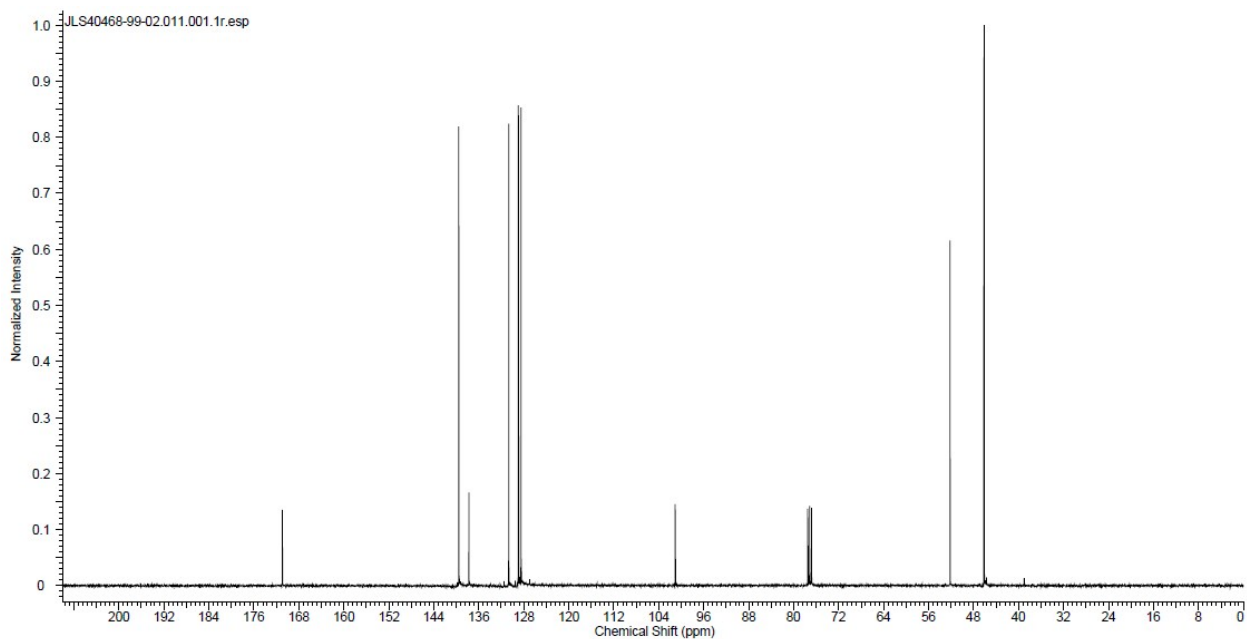


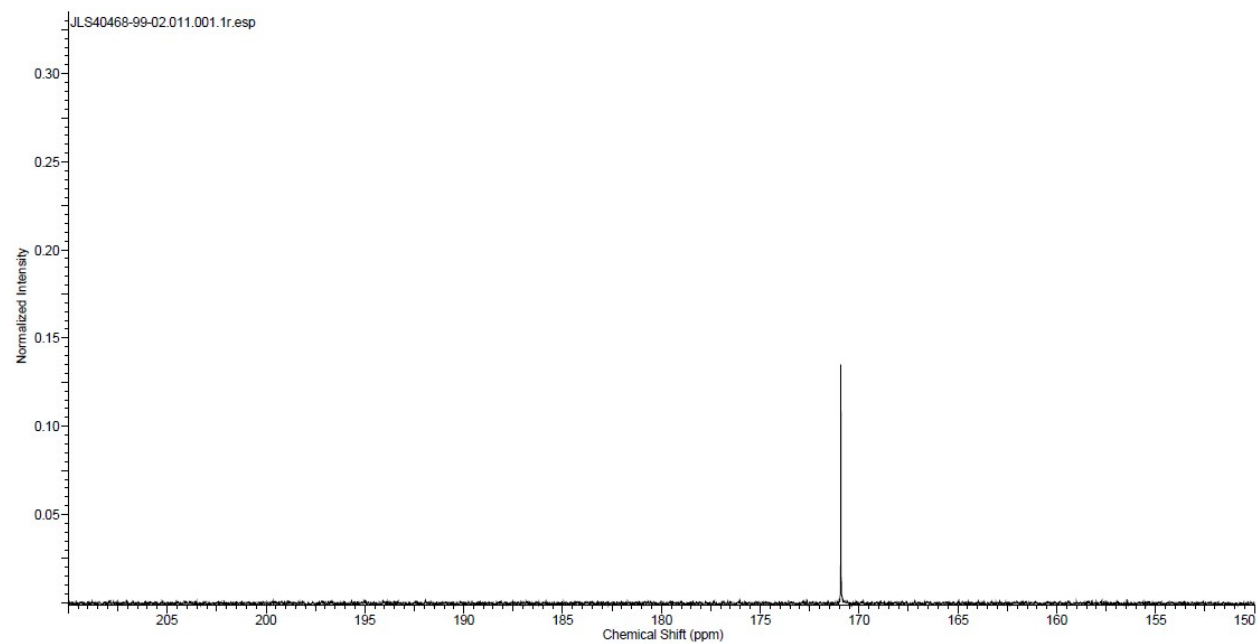
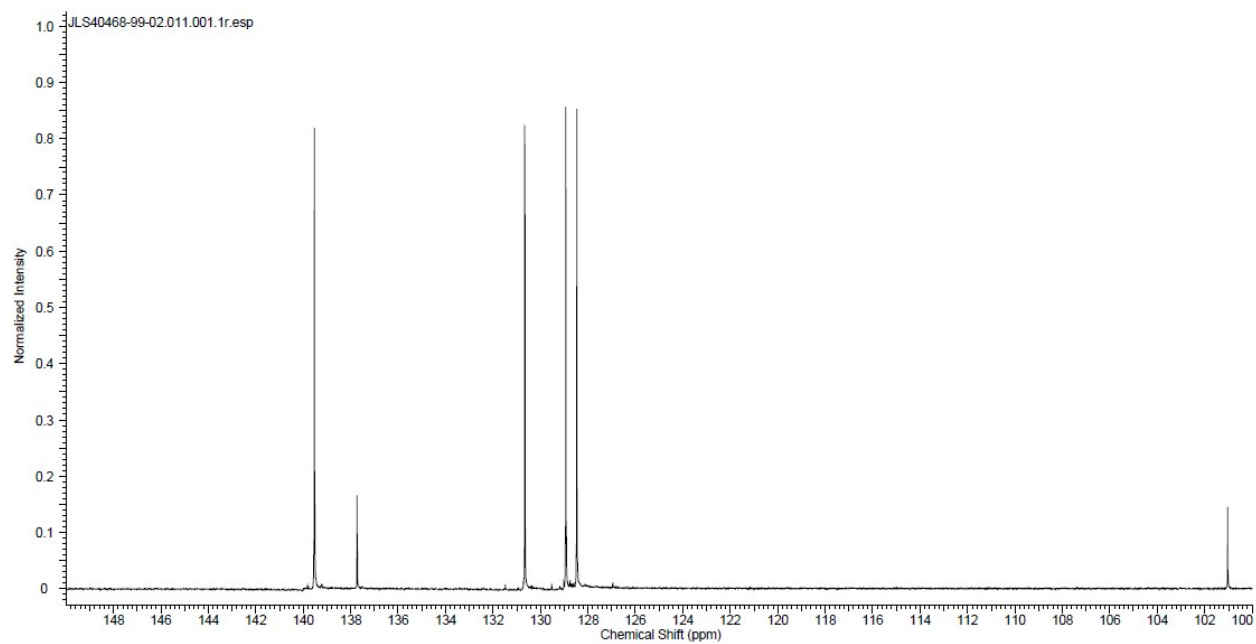
7. Graphical display of data provided in **Table 2**



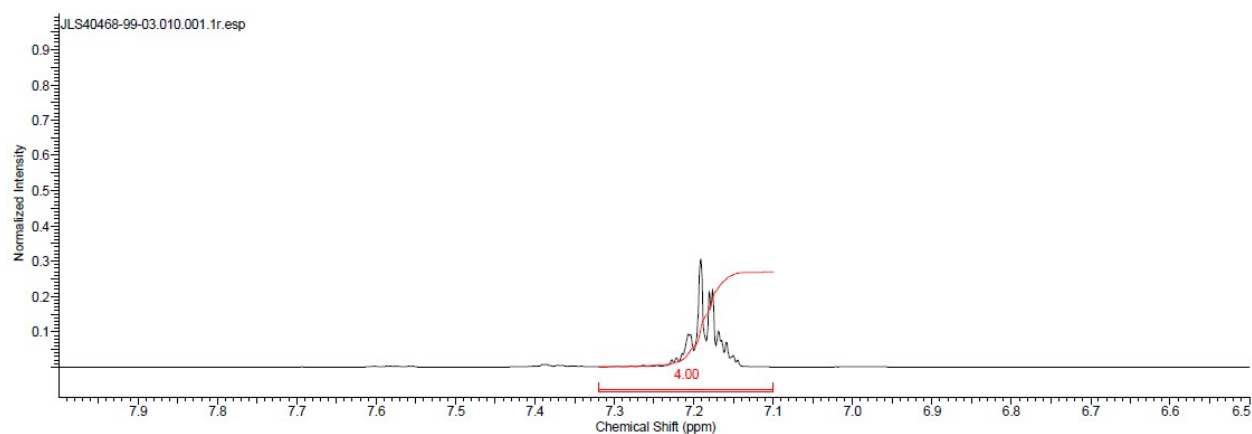
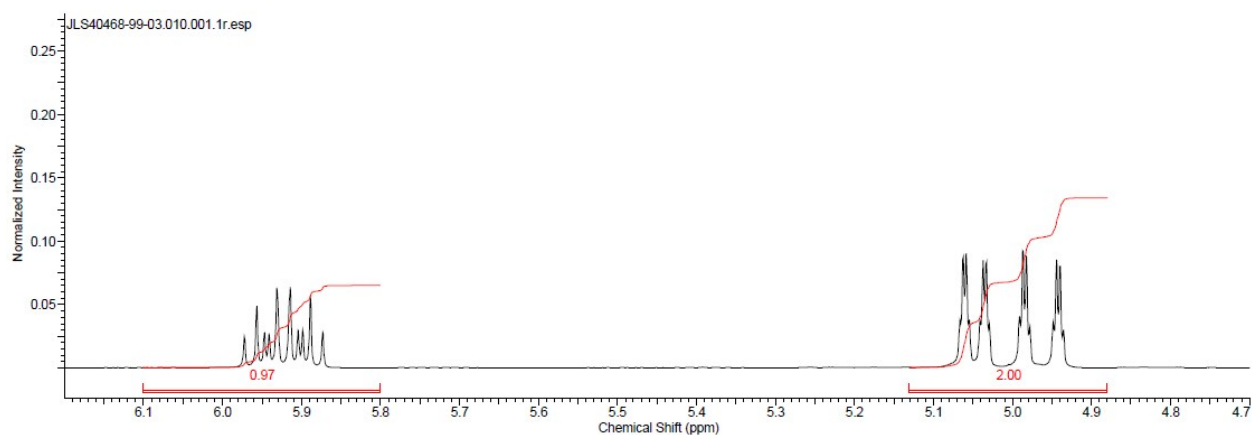
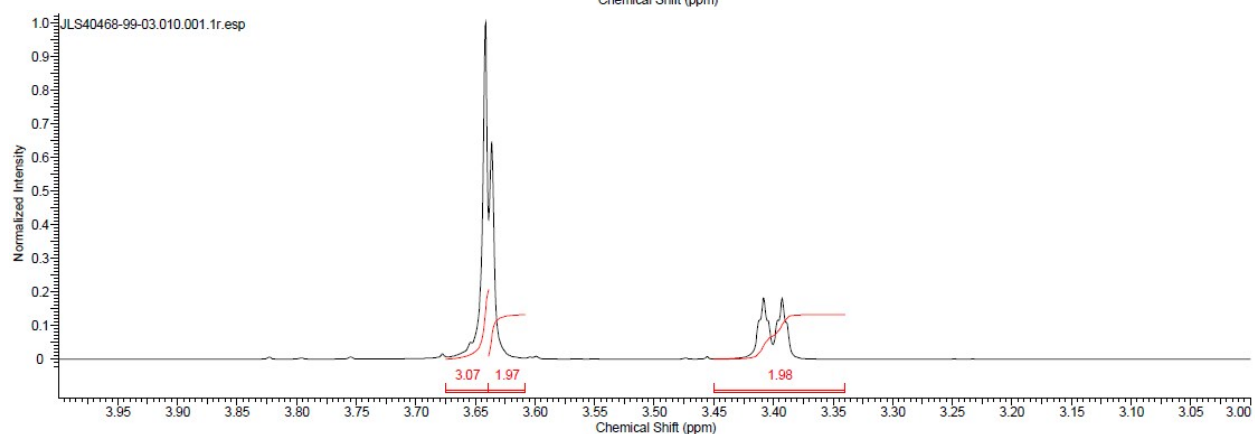
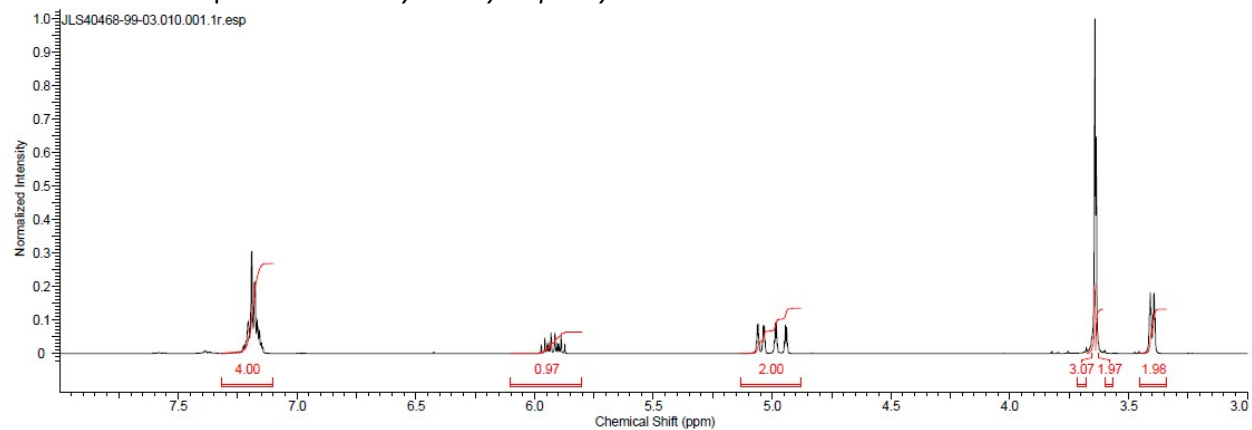
8. ^1H and ^{13}C NMR Spectra for *Methyl 2'-iodo-2-phenylacetate*

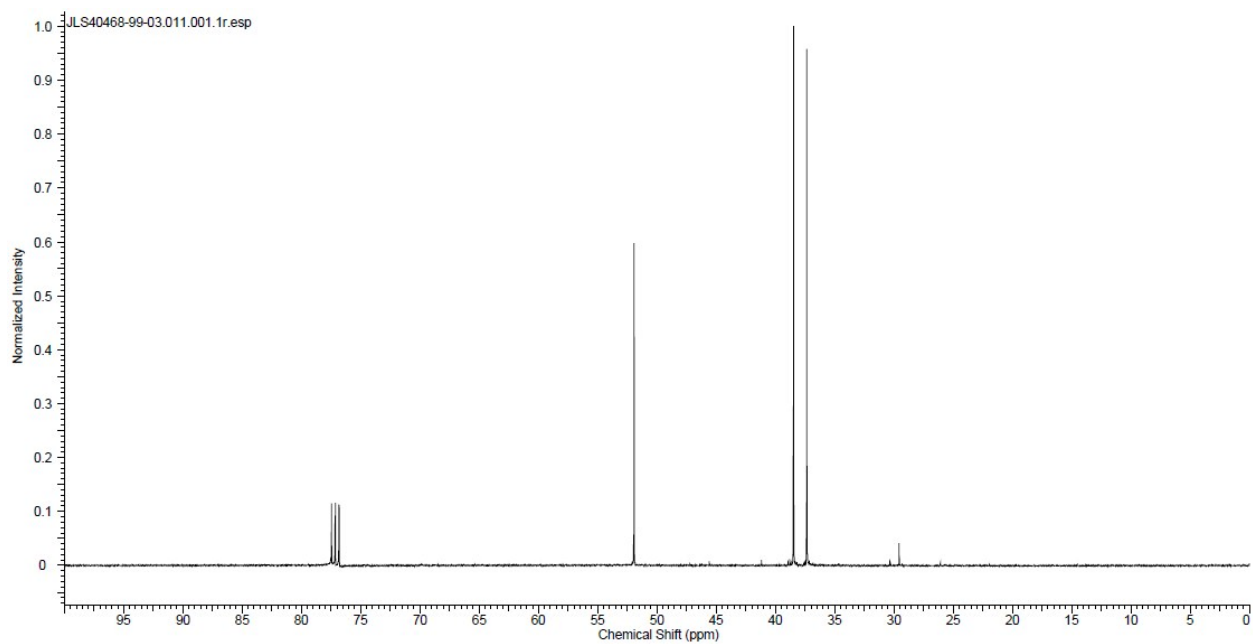
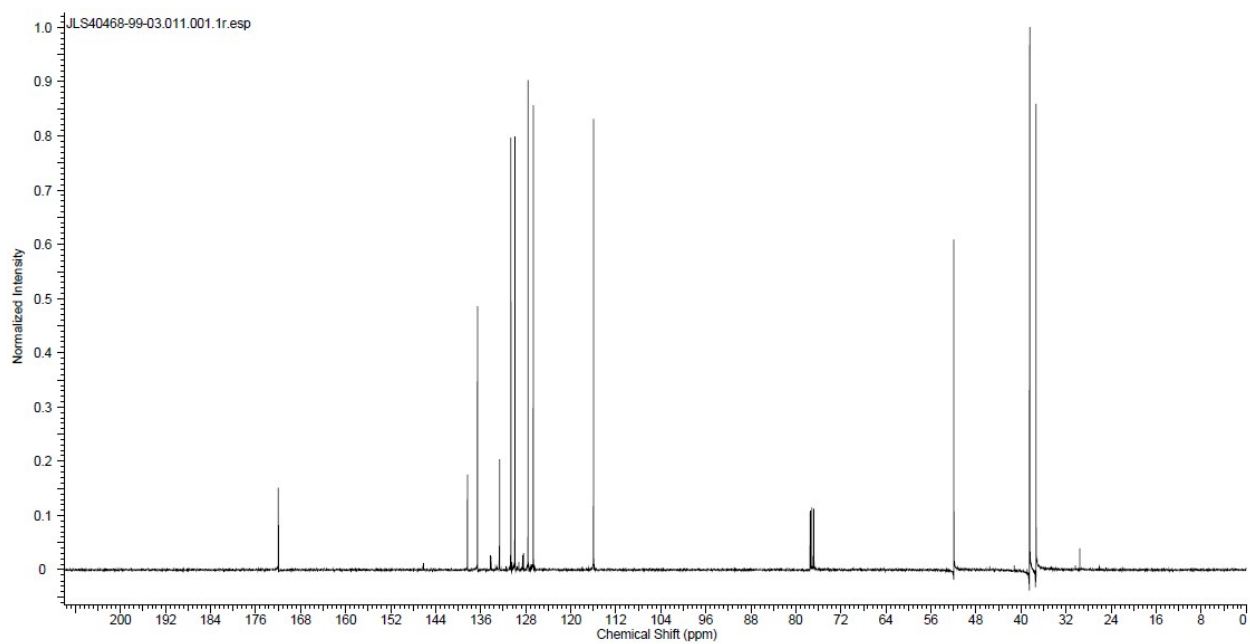


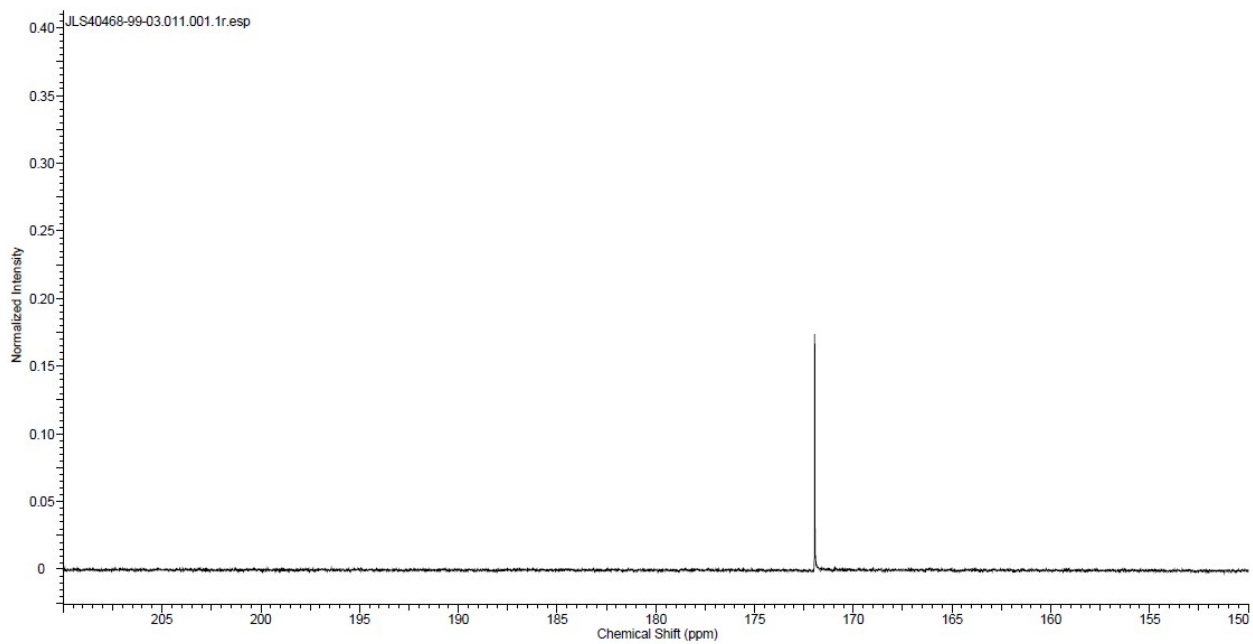
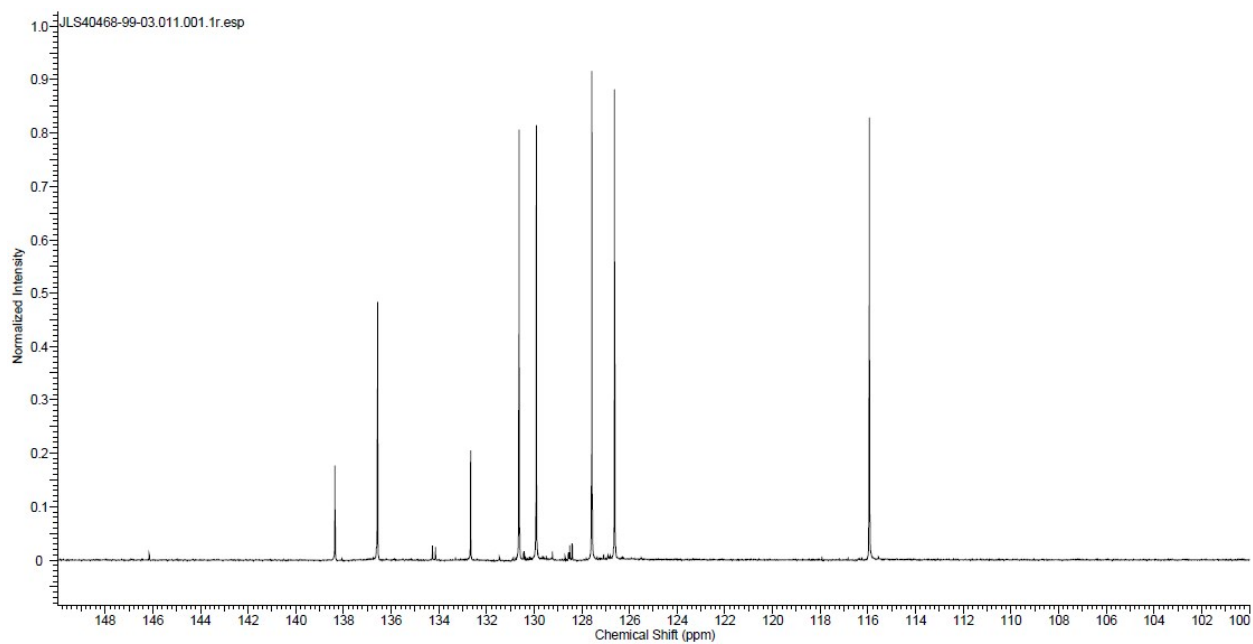




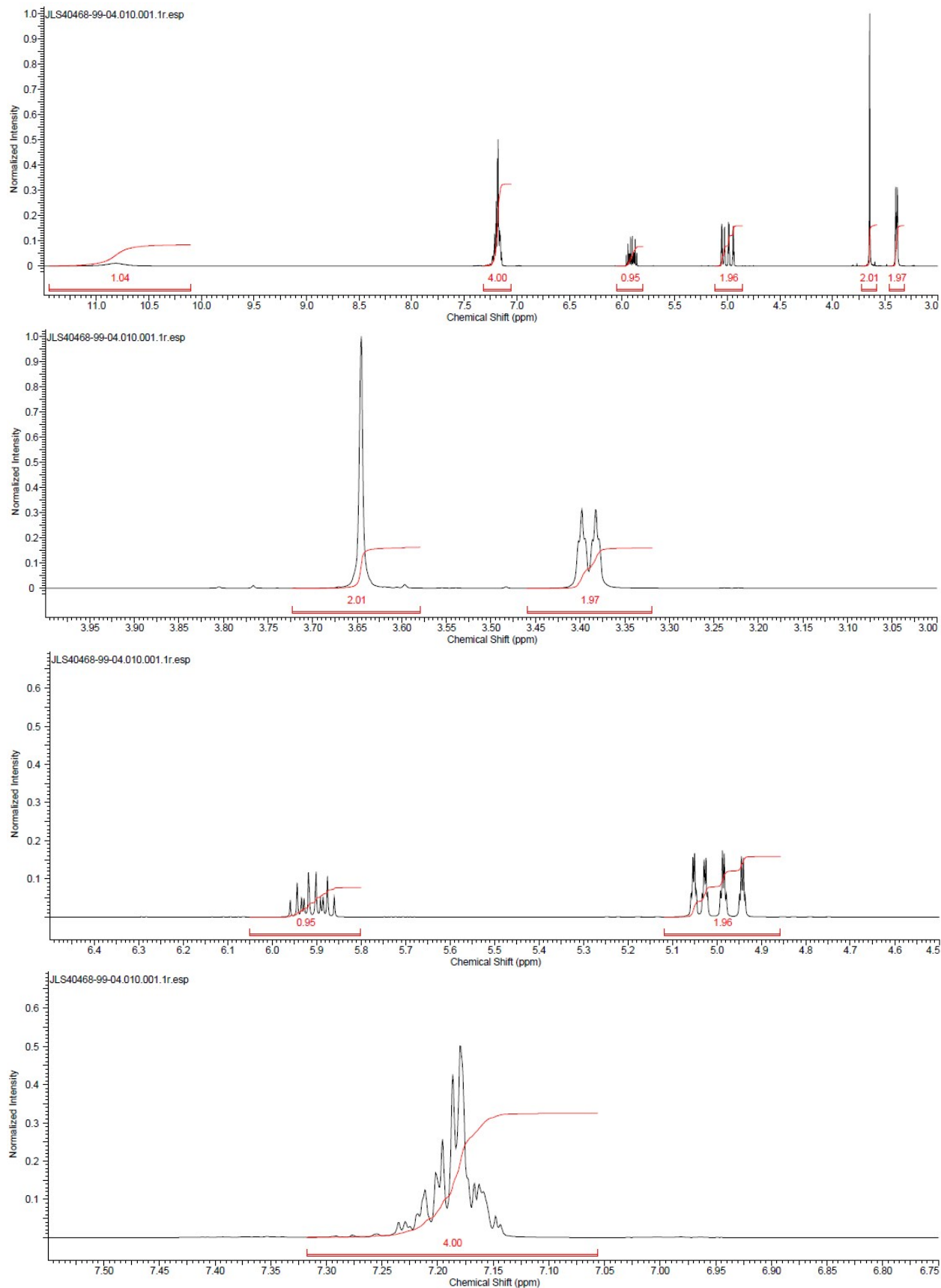
9. ^1H and ^{13}C NMR Spectra for Methyl 2'-allyl-2-phenylacetate

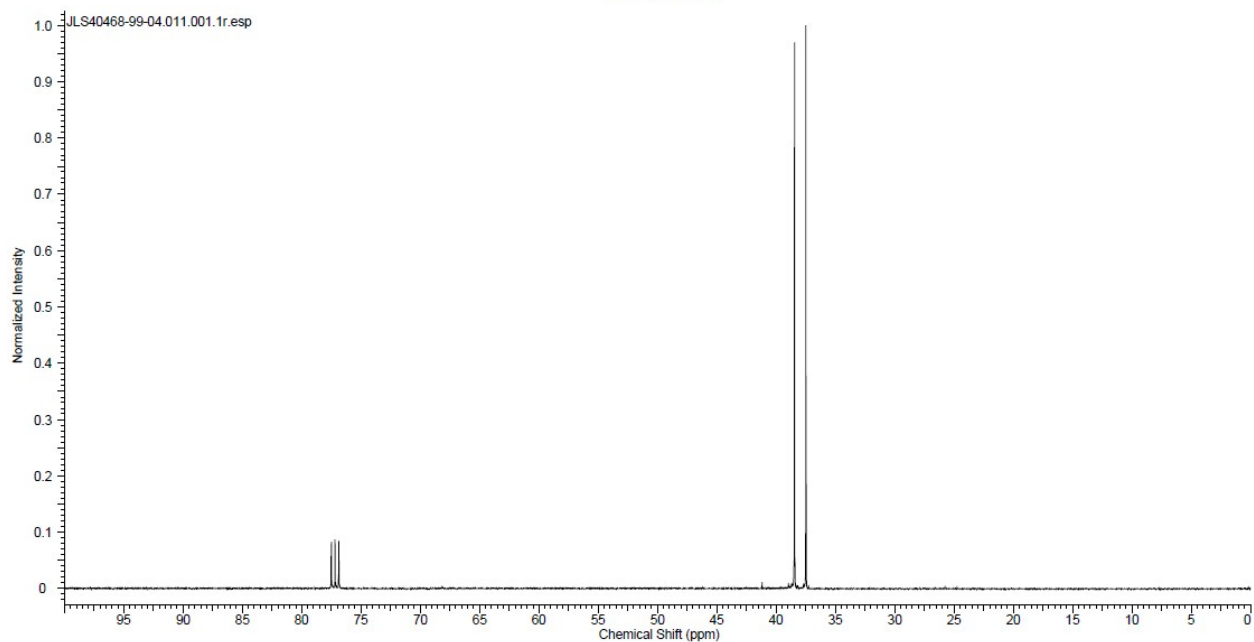
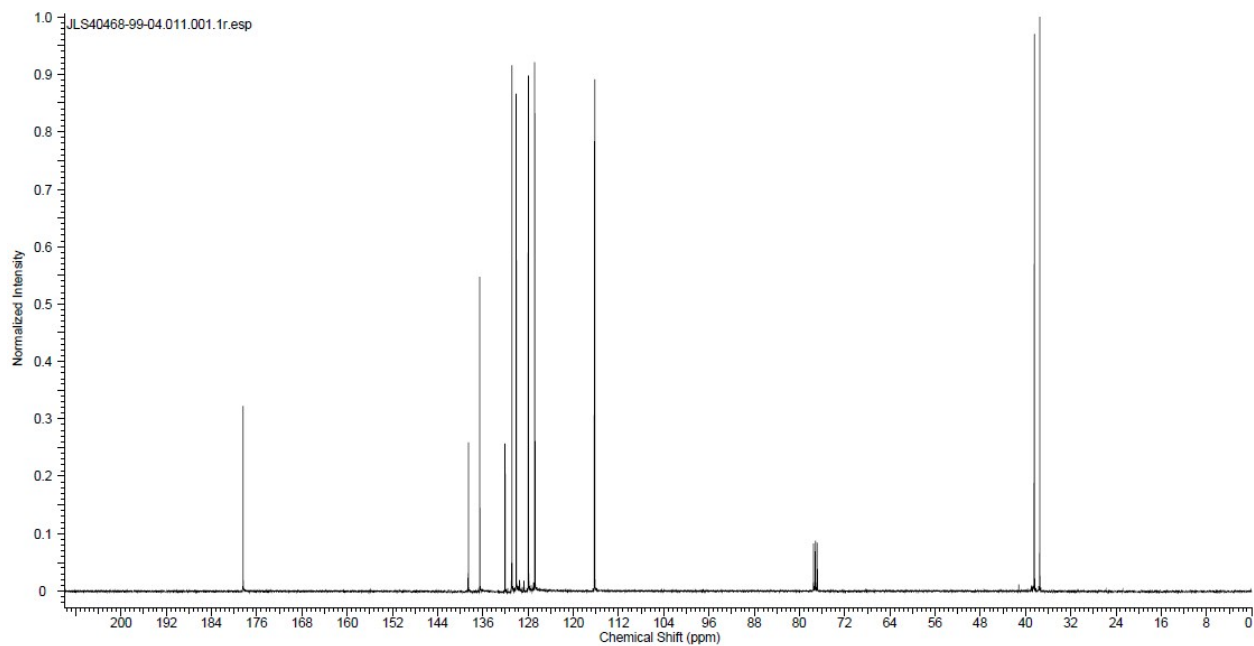


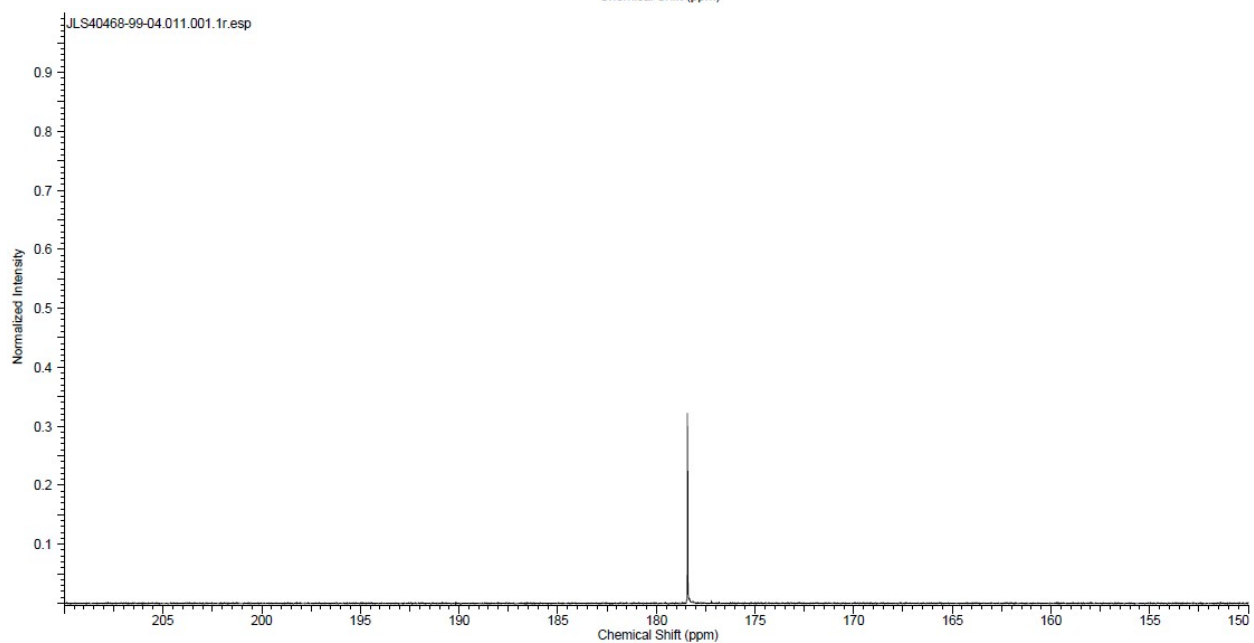
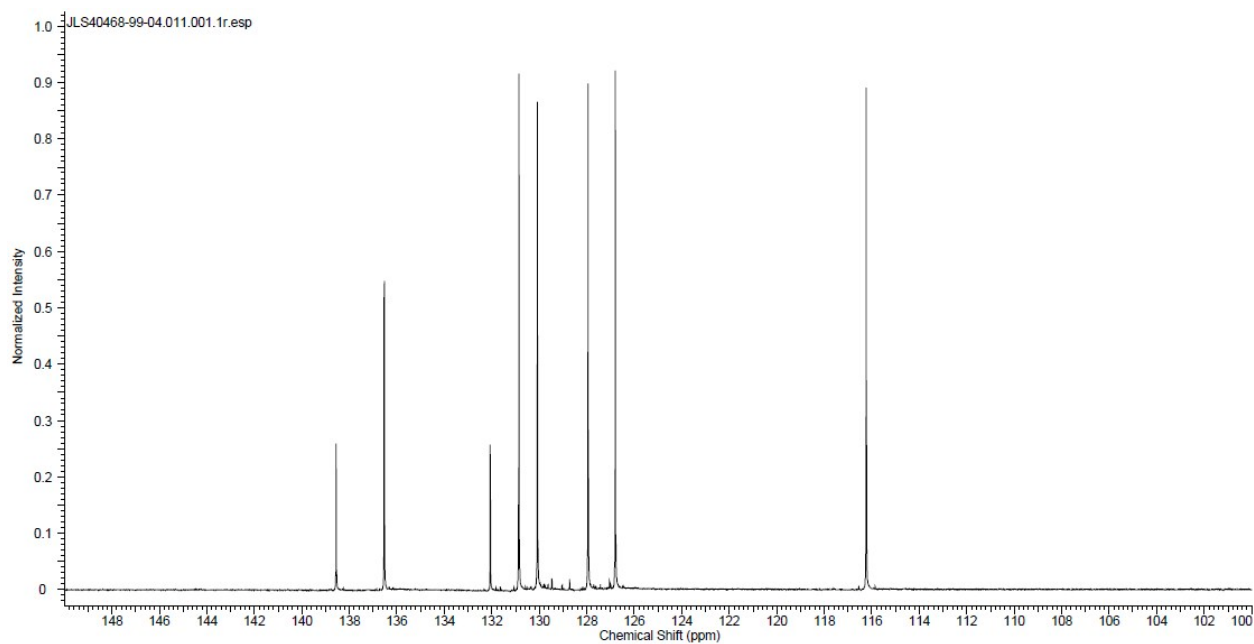




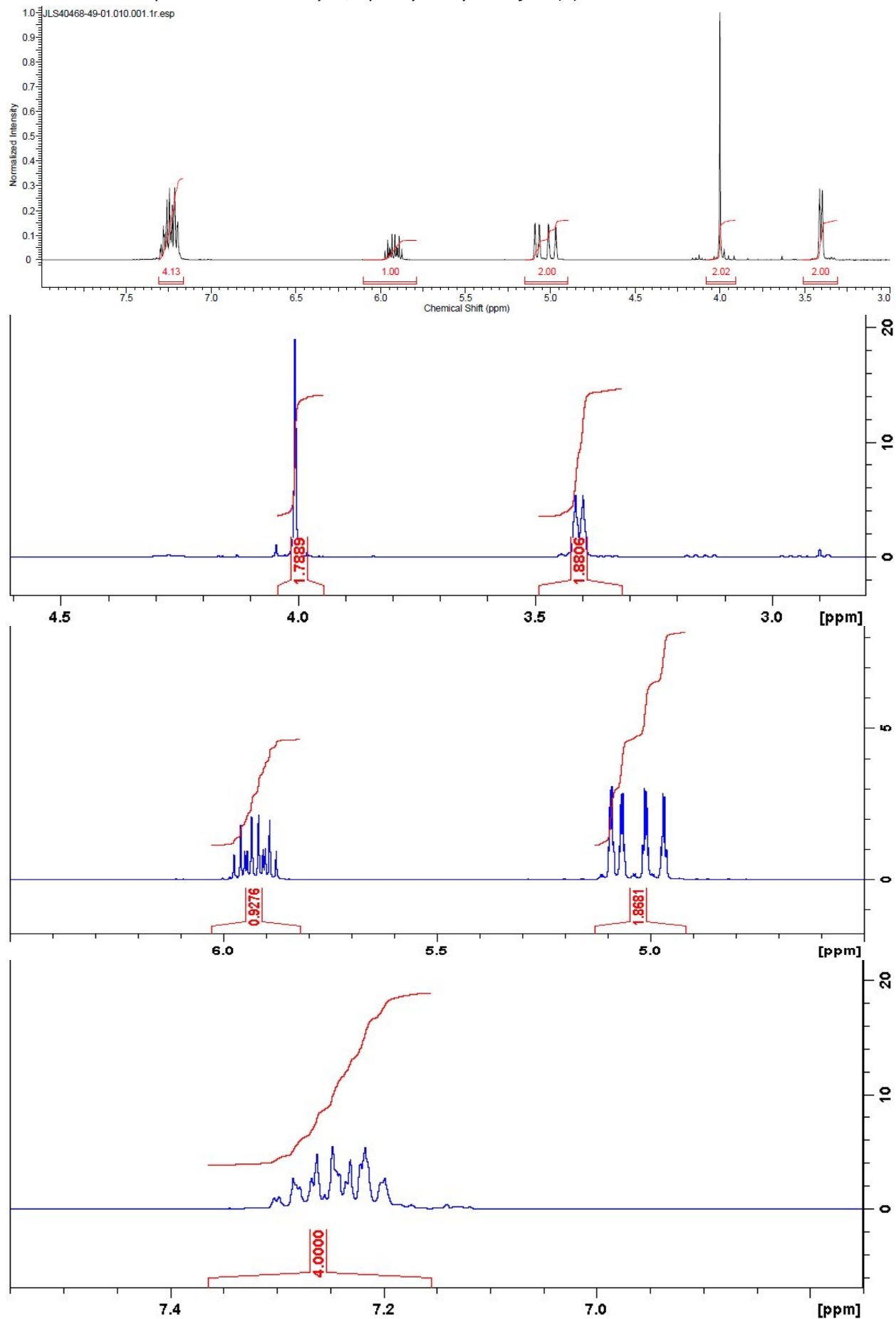
10. ^1H and ^{13}C NMR Spectra for 2'-allyl-2-phenylacid

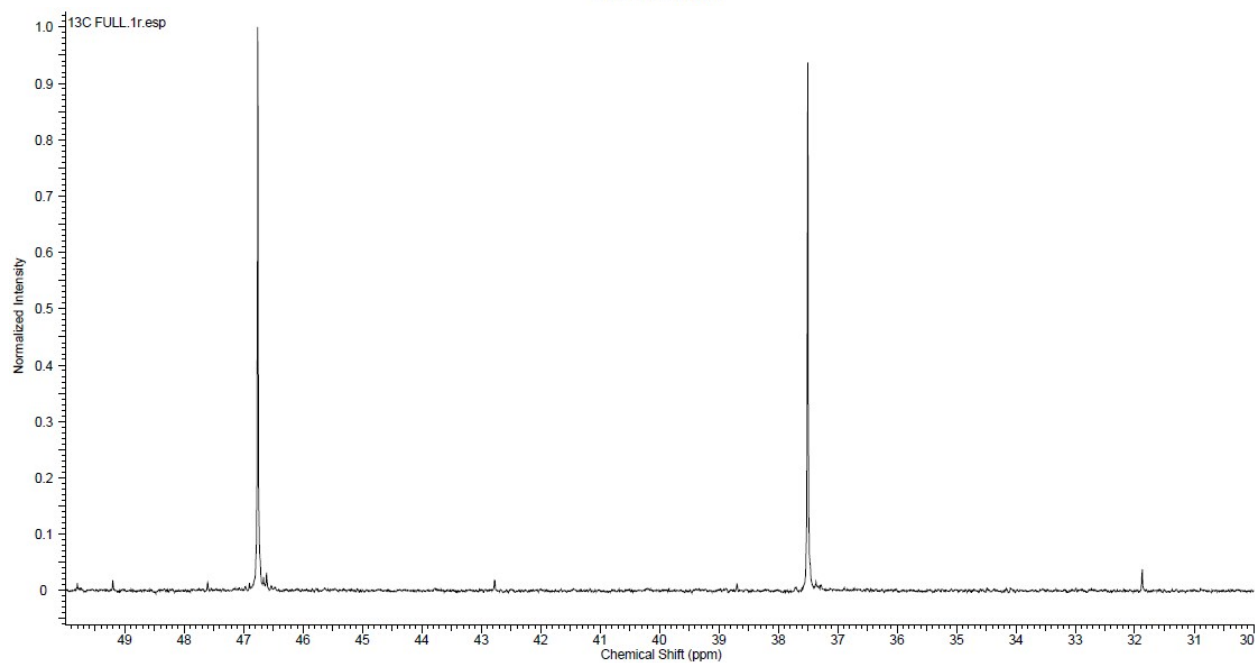
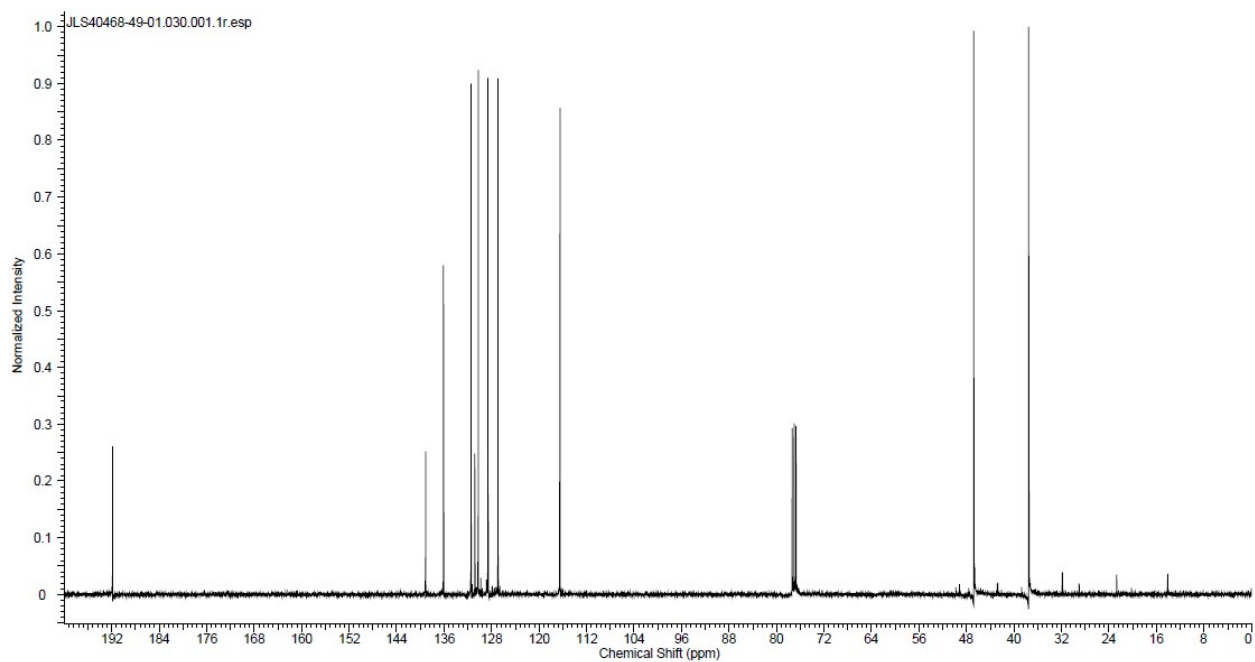


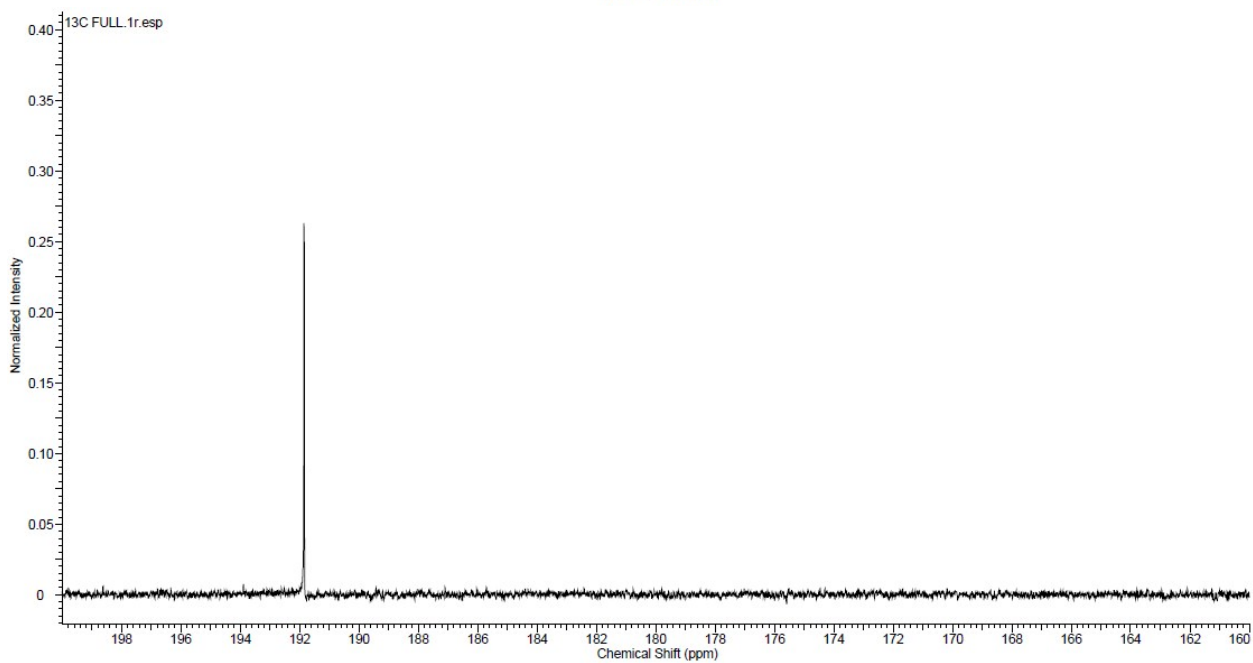
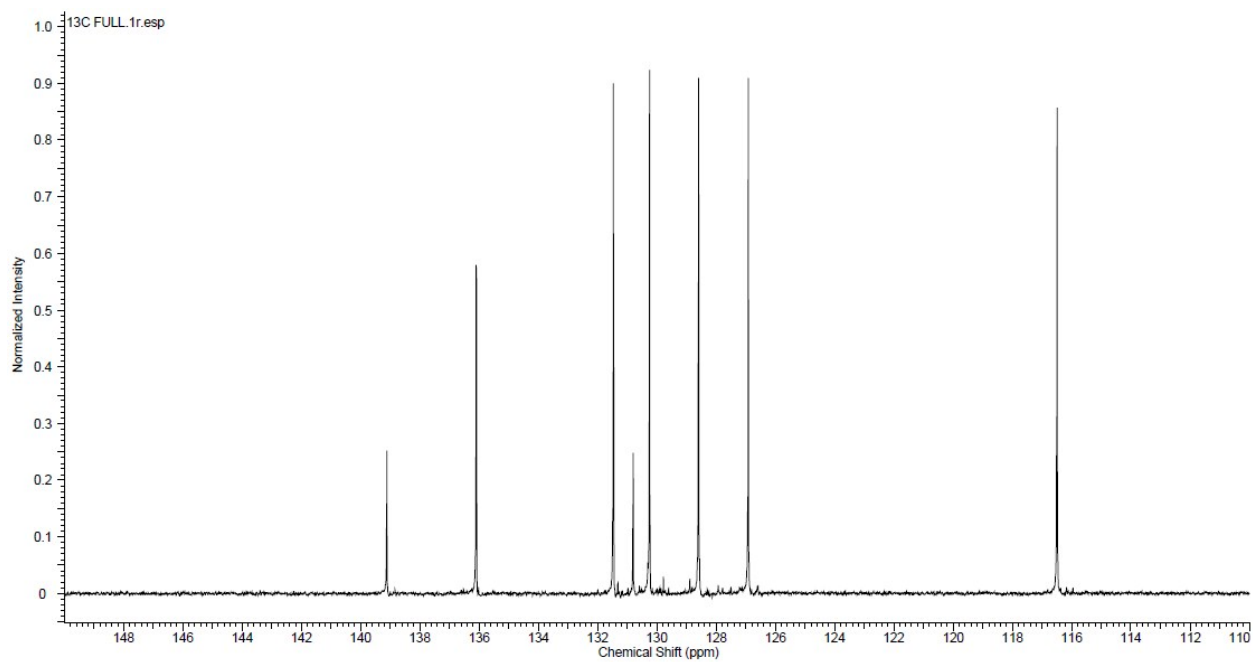




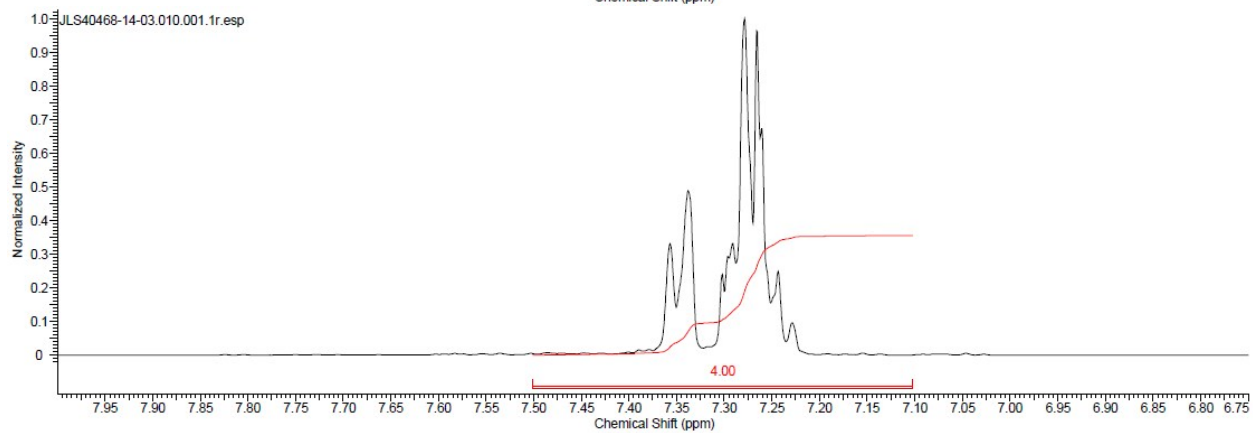
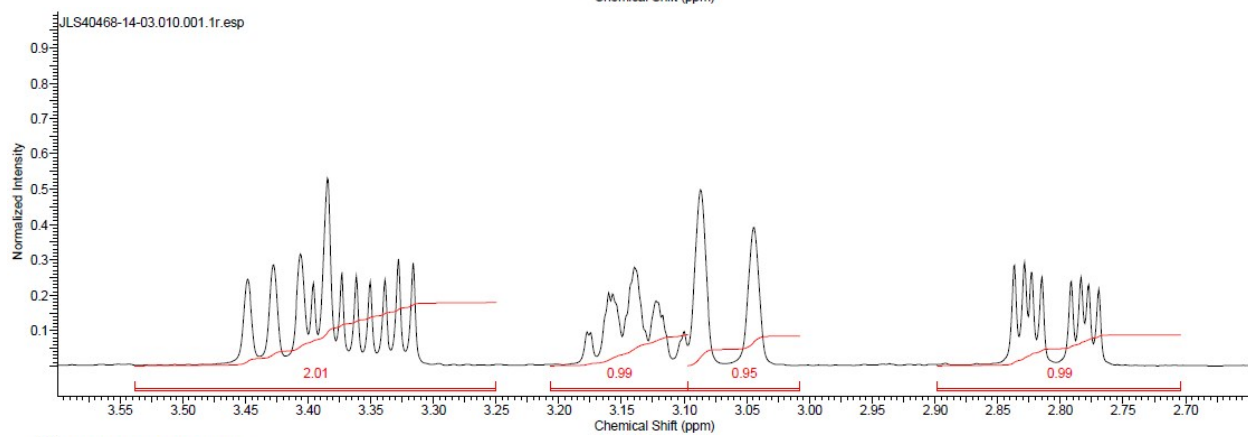
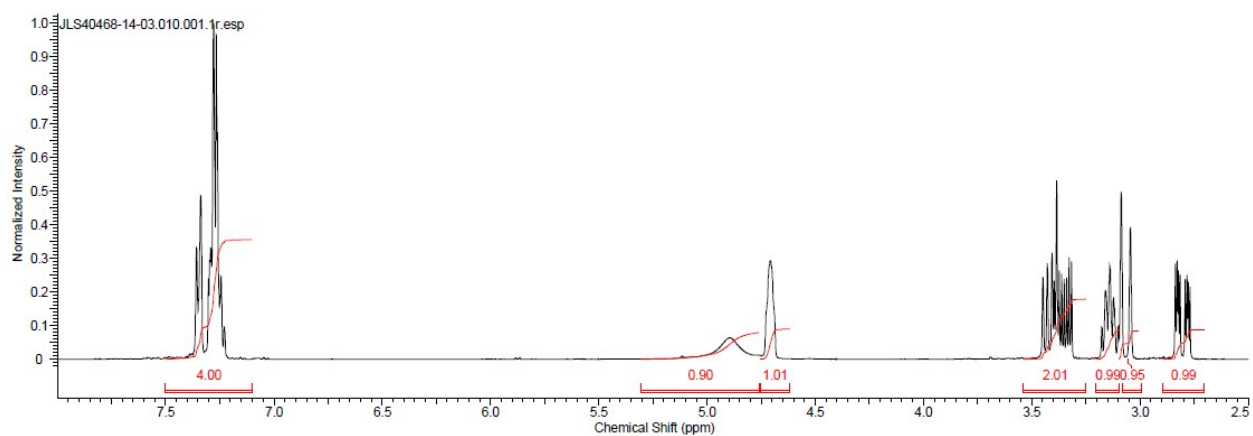
11. ^1H and ^{13}C NMR Spectra for 2,2'-Diallyl 2,2-phenylacetyl disulfide (**8**)

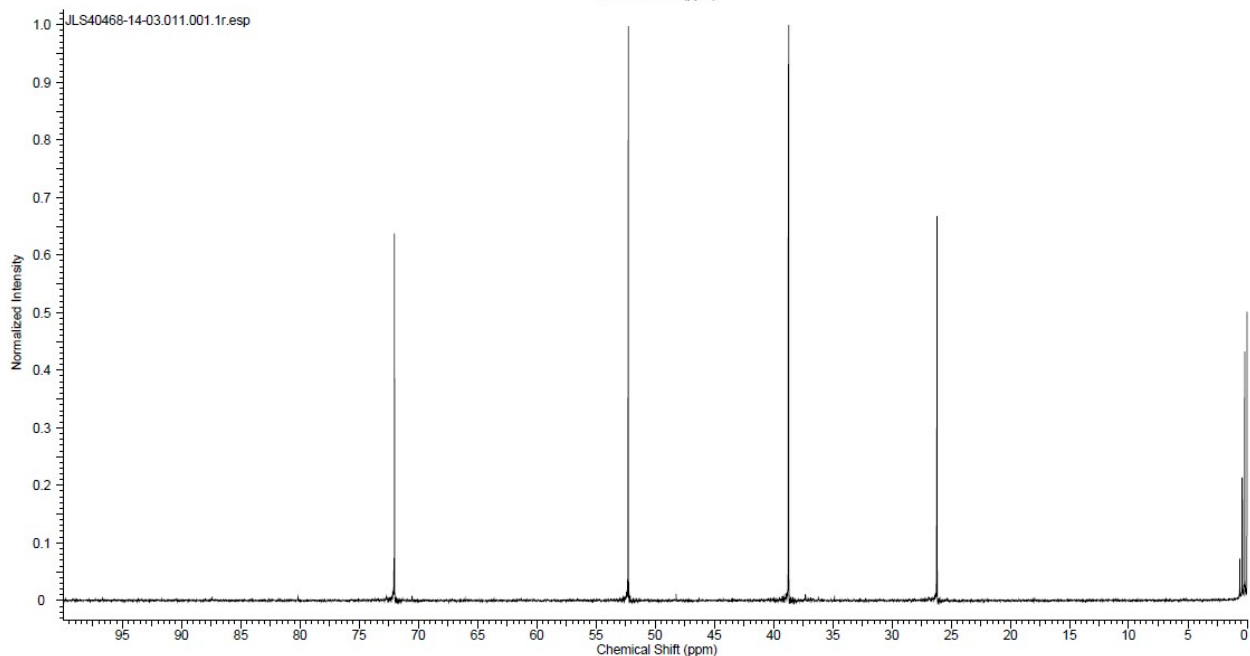
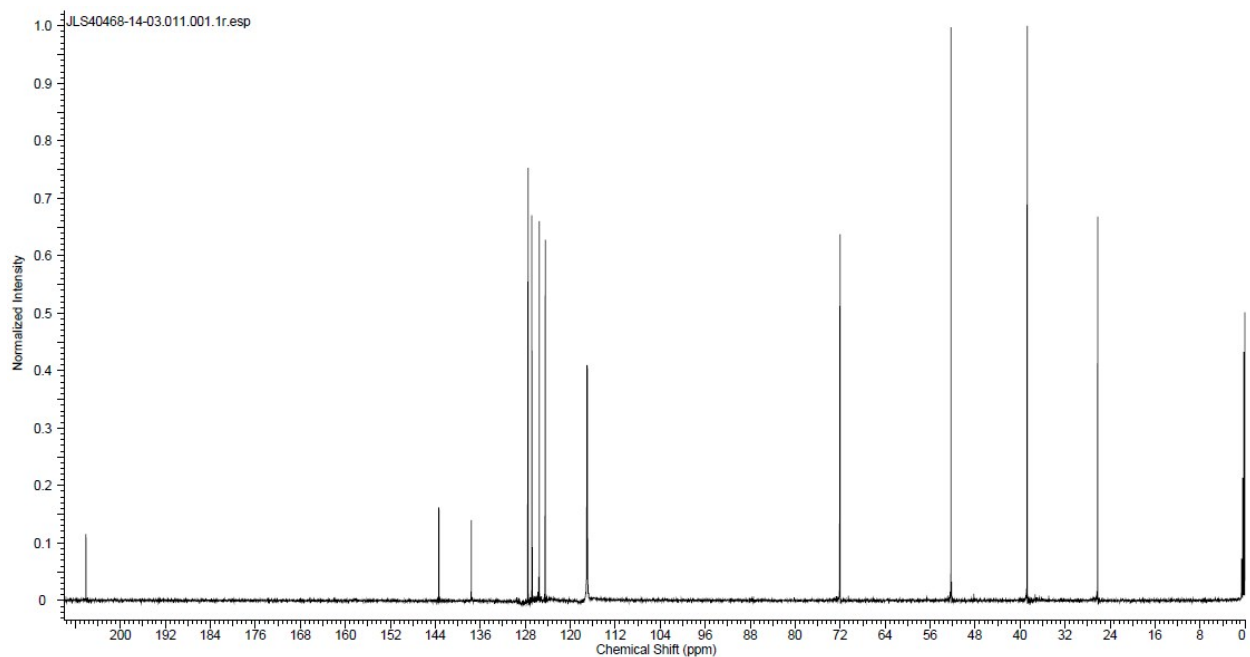


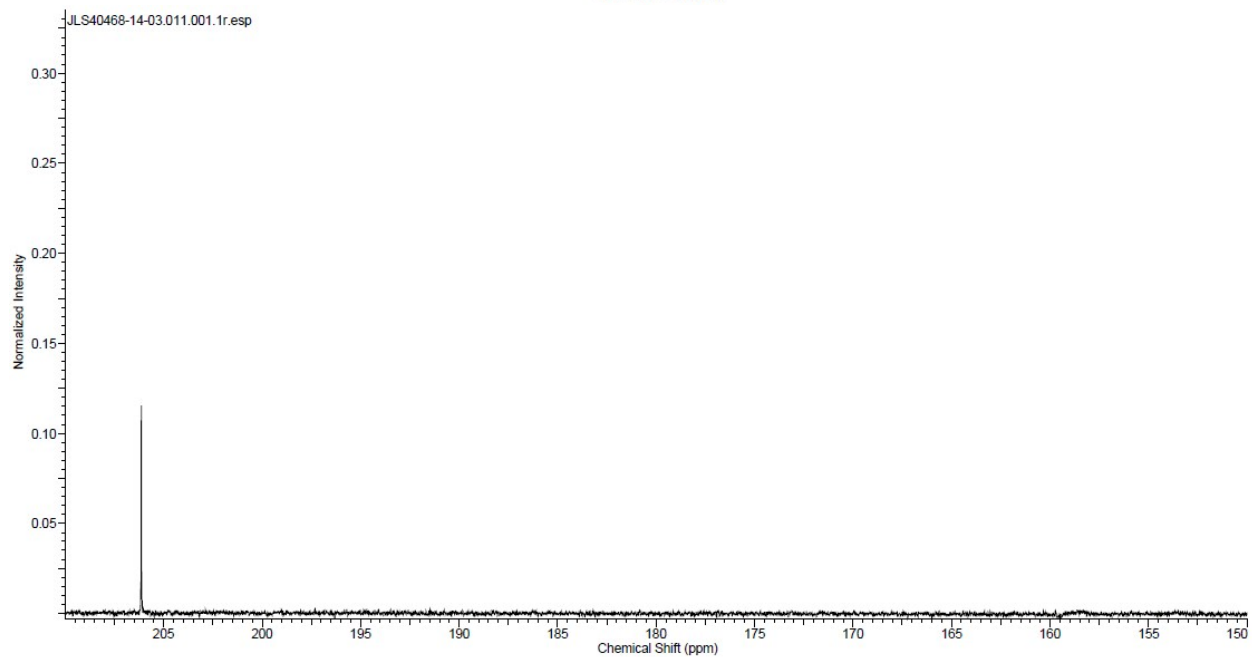
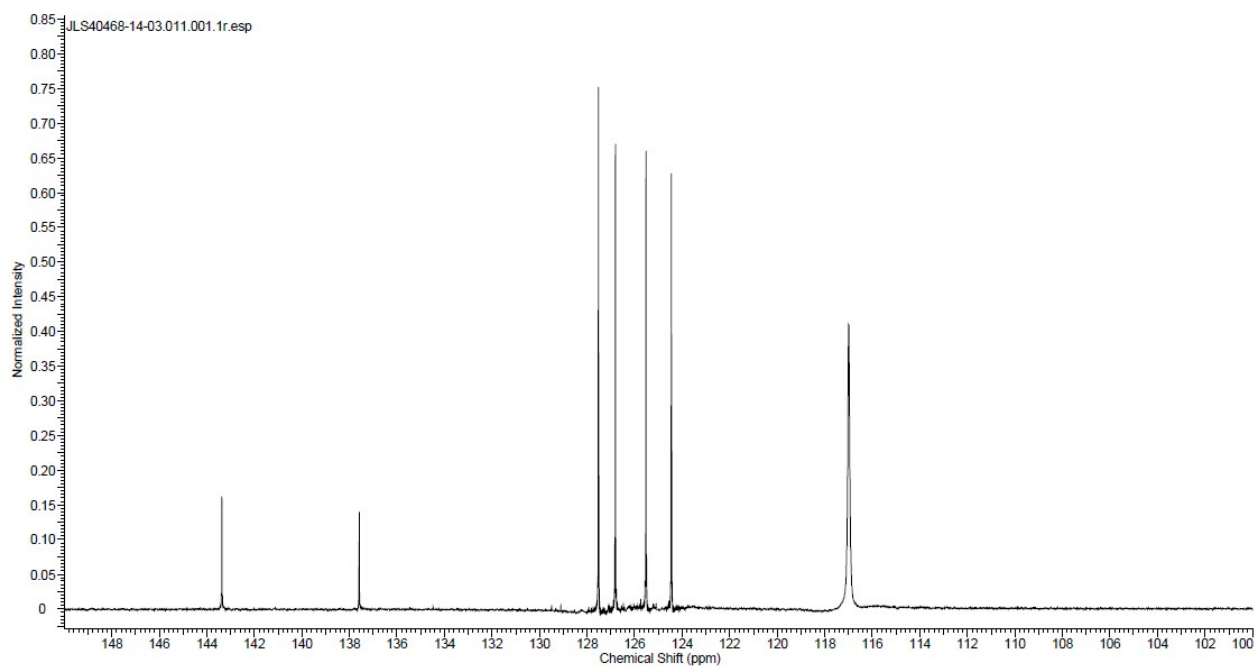




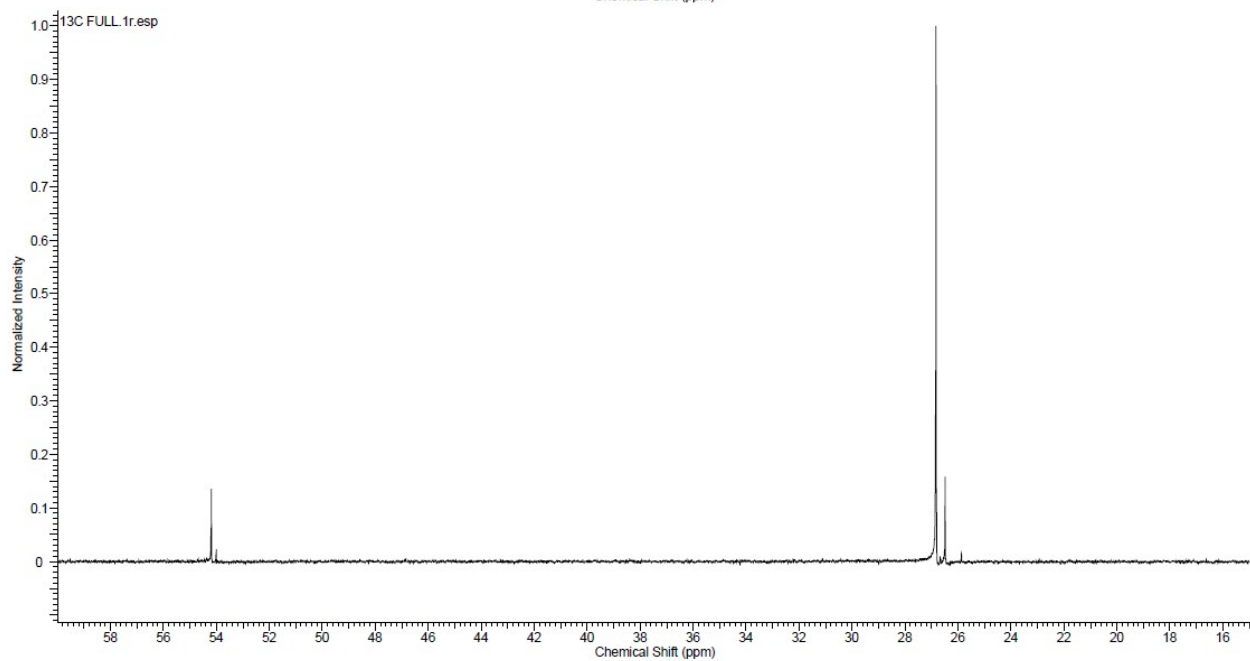
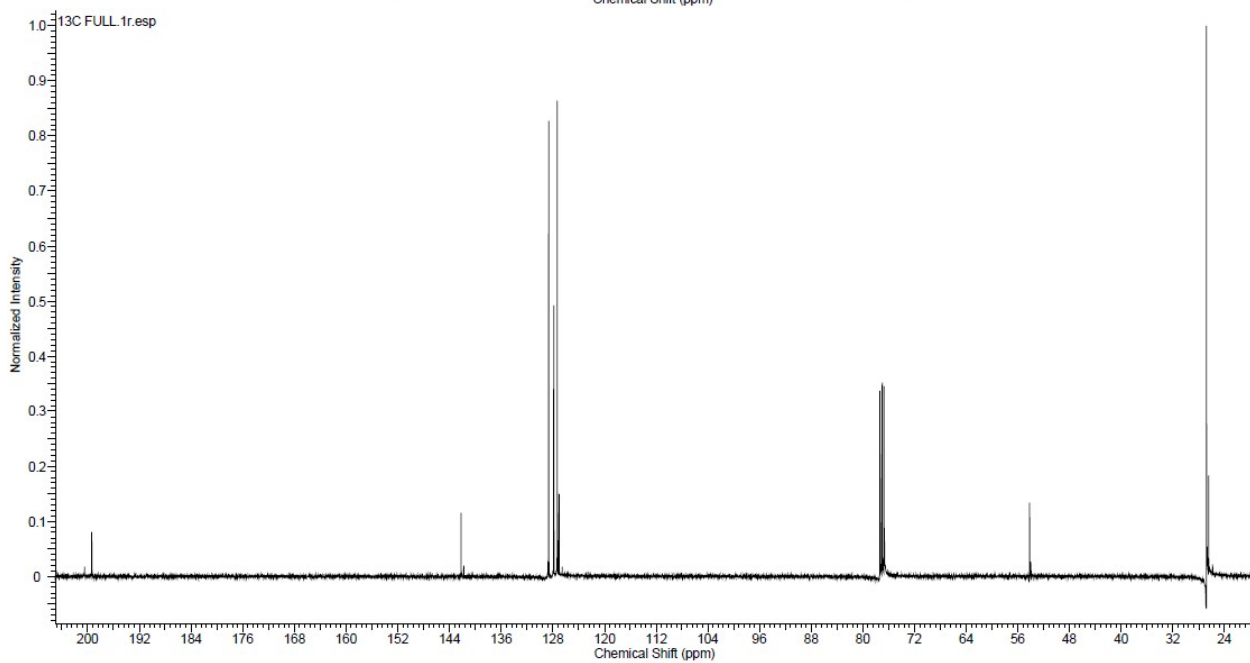
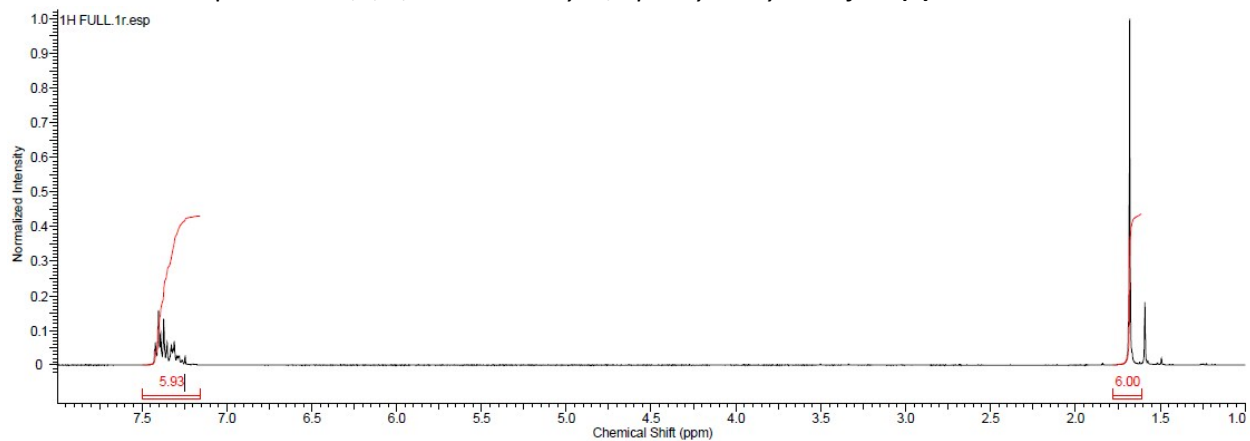
12. ^1H and ^{13}C NMR Spectra for 7,7a-dihydro-1H-cyclobuta[a]inden-2(2aH)-one (9)

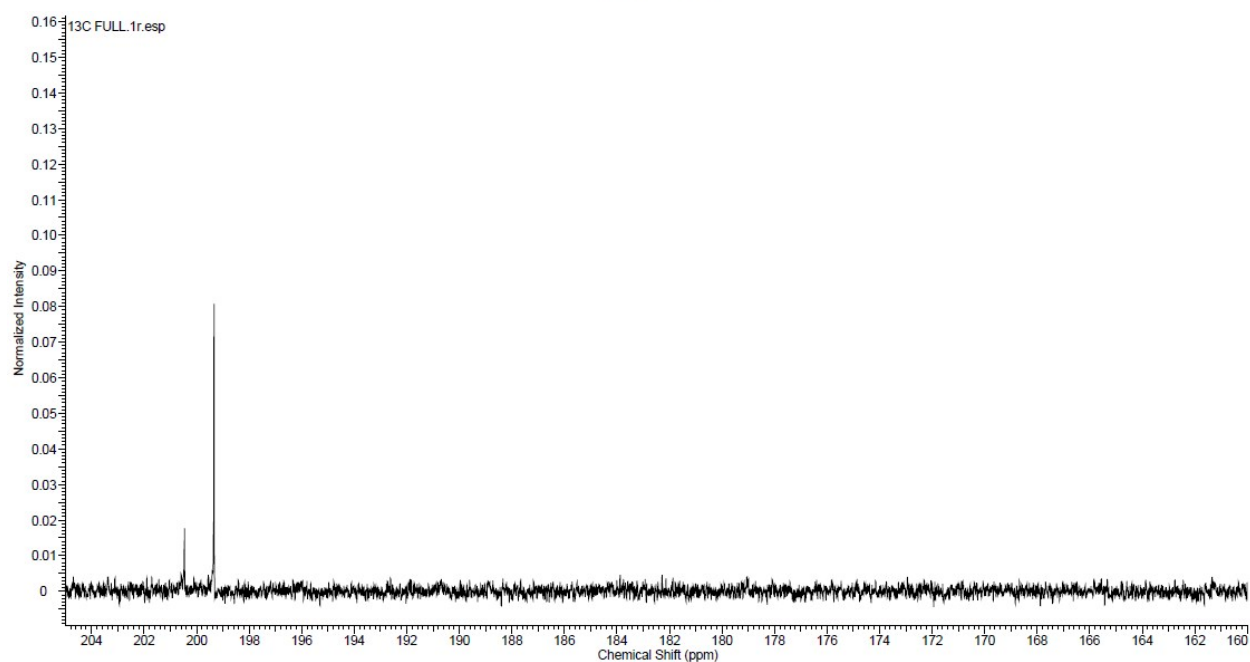
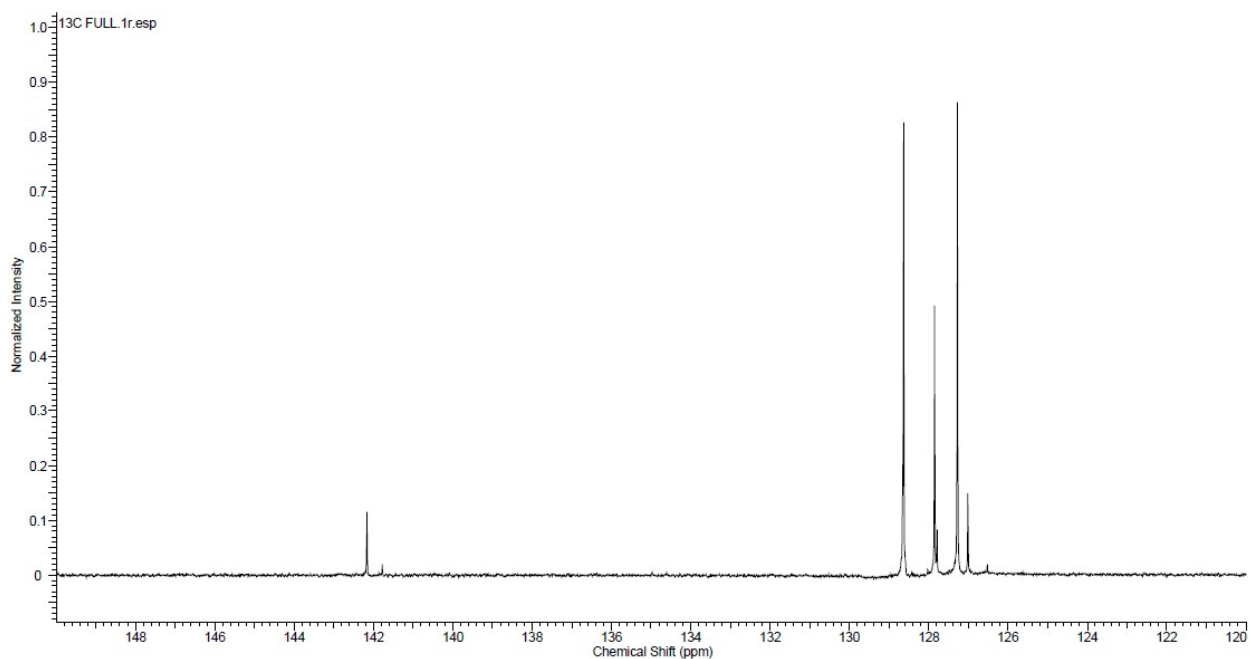




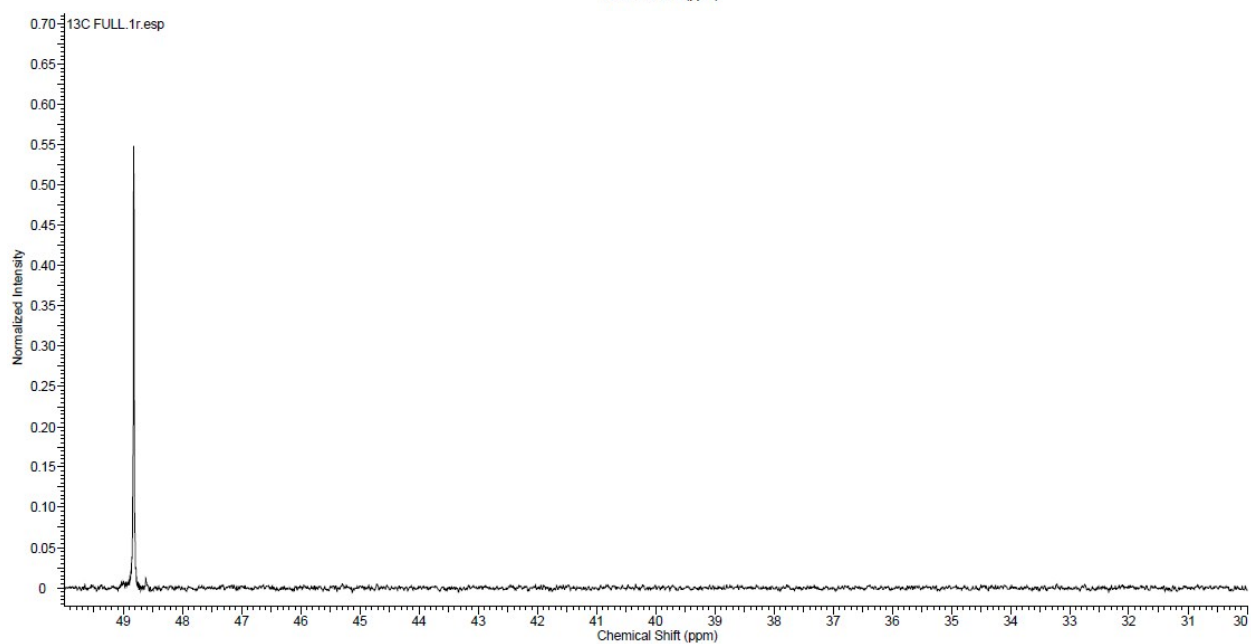
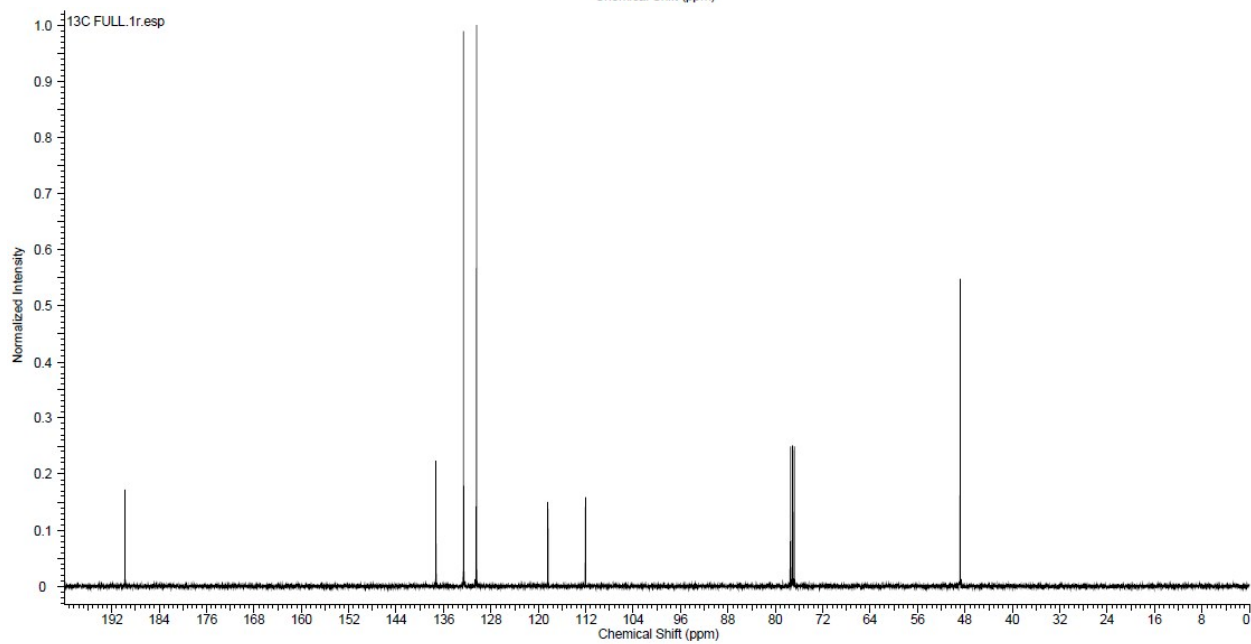
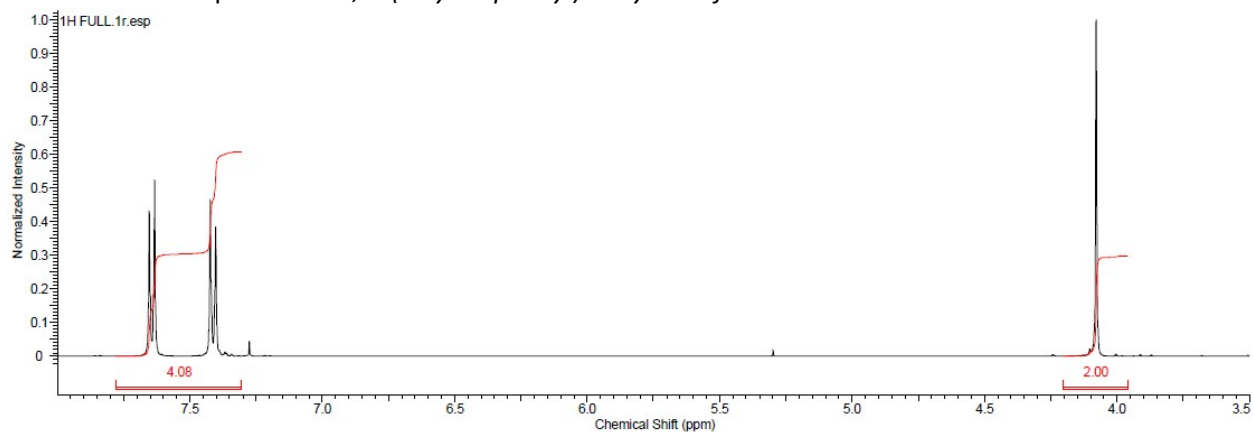


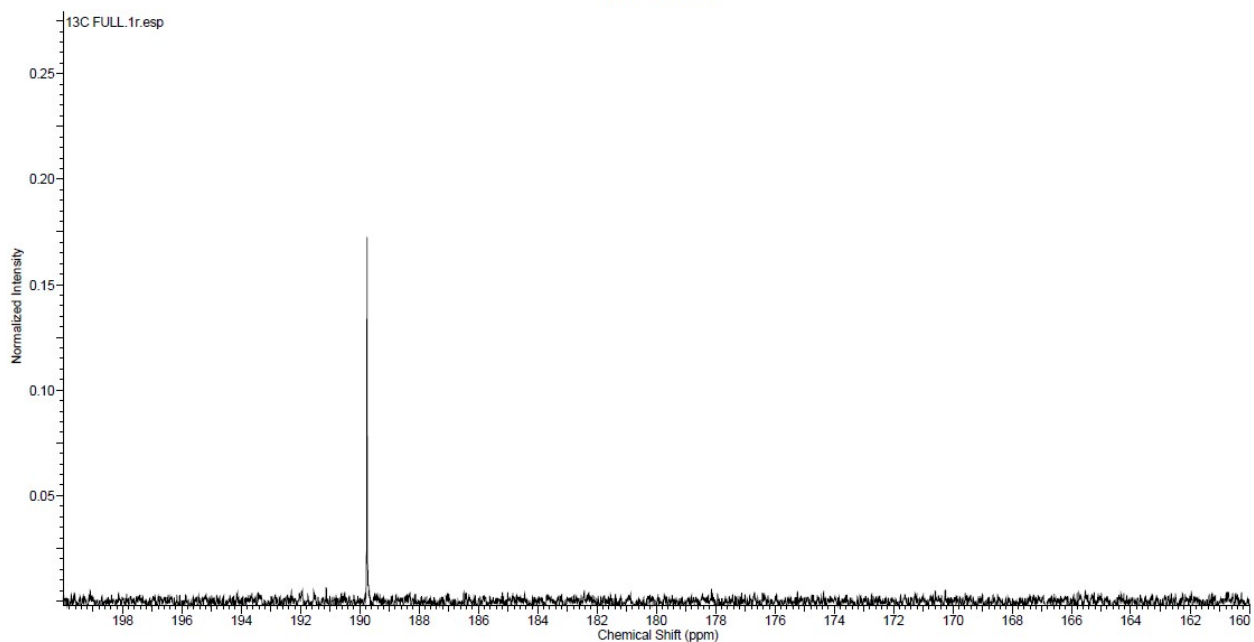
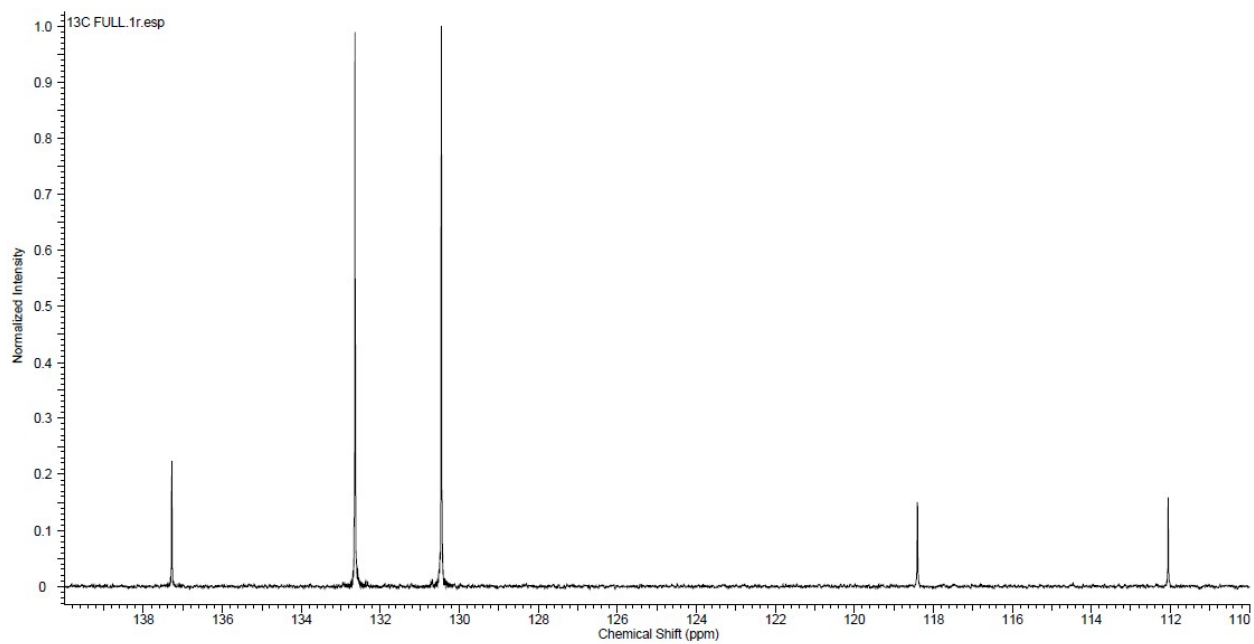
13. ^1H and ^{13}C NMR Spectra for 2,2,2',2'-Tetramethyl 2,2'-phenylacetyl disulfide (**7**)



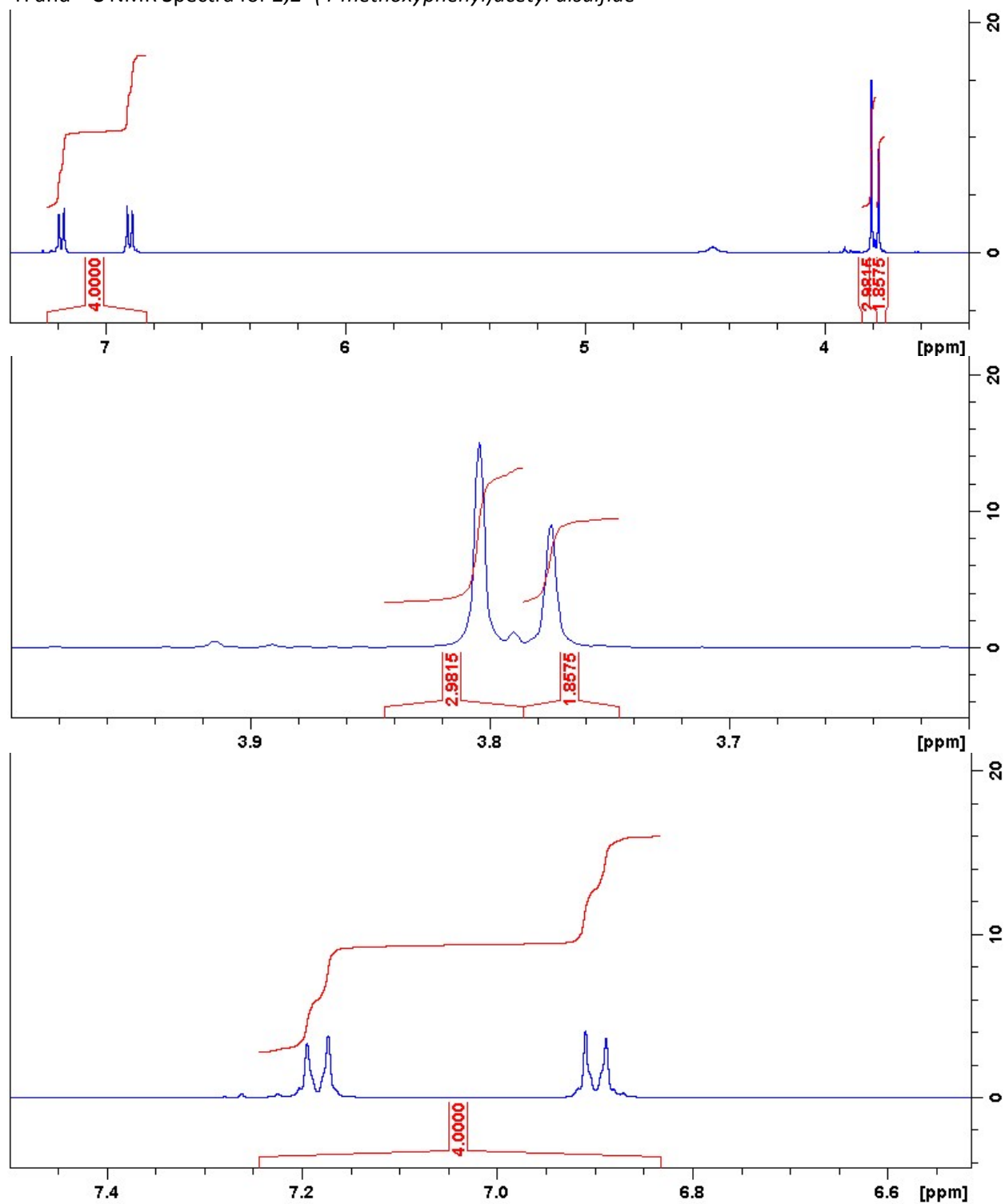


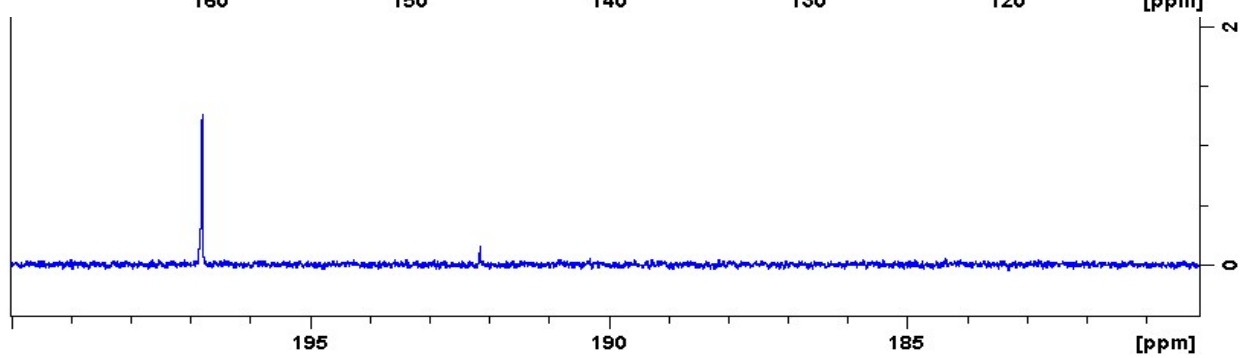
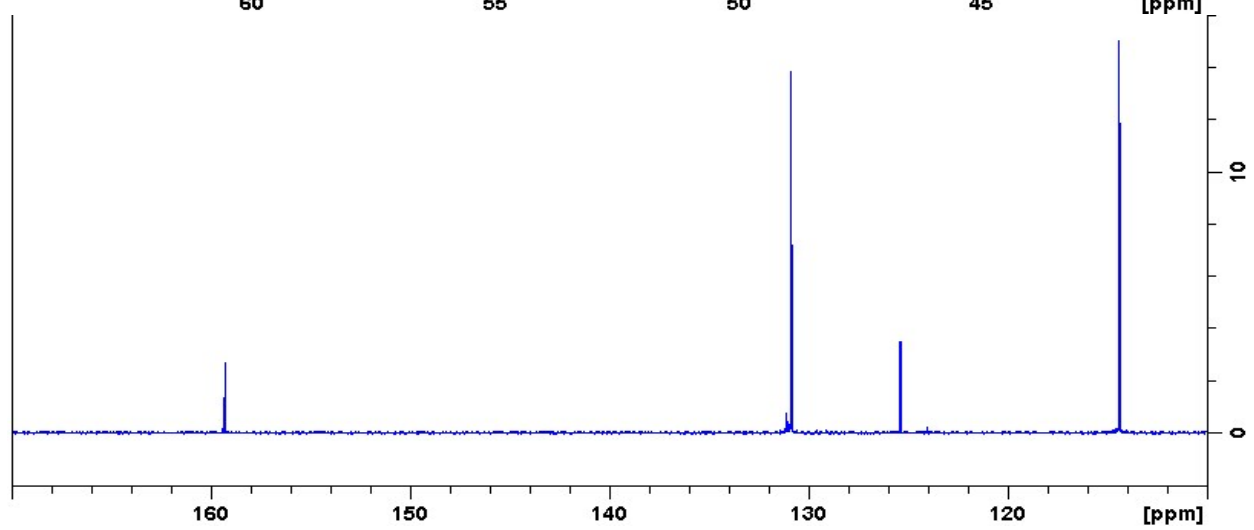
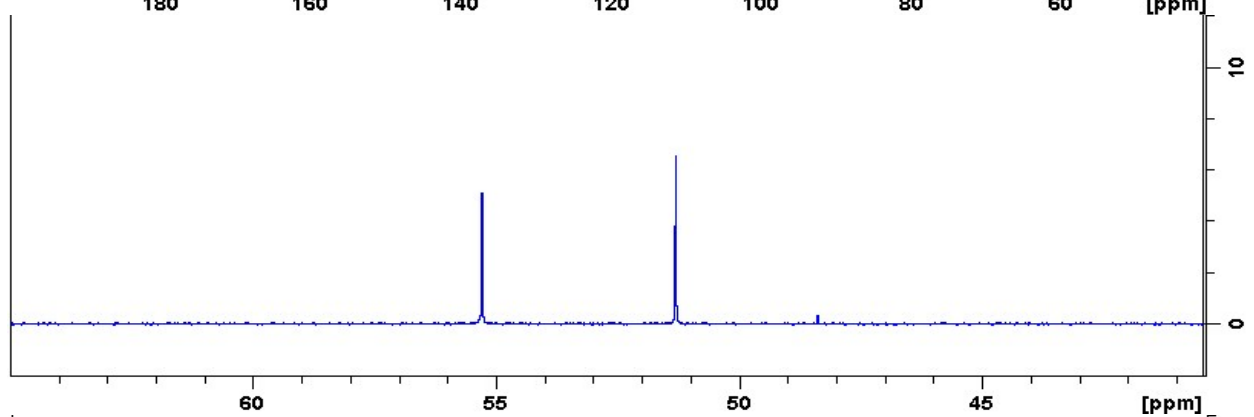
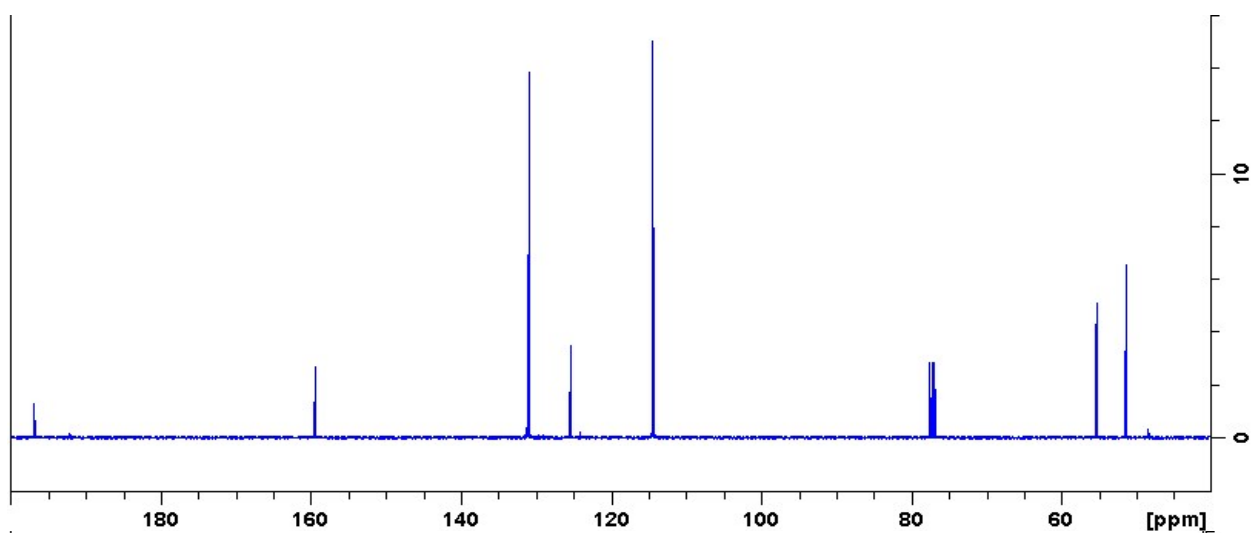
14. ^1H and ^{13}C NMR Spectra for 2,2'-(4-cyanophenyl)acetyl disulfide





15. ^1H and ^{13}C NMR Spectra for 2,2'-(4-methoxyphenyl)acetyl disulfide





16. ^1H and ^{13}C NMR Spectra for *Bis-benzoyl disulfide* (see also section 5 for X-Ray crystal structure)

