

One-pot pseudo three-component reaction of nitroketene-*N,S*-acetals
and aldehydes for synthesis of highly functionalized hexa-substituted
1,4-dihydropyridines

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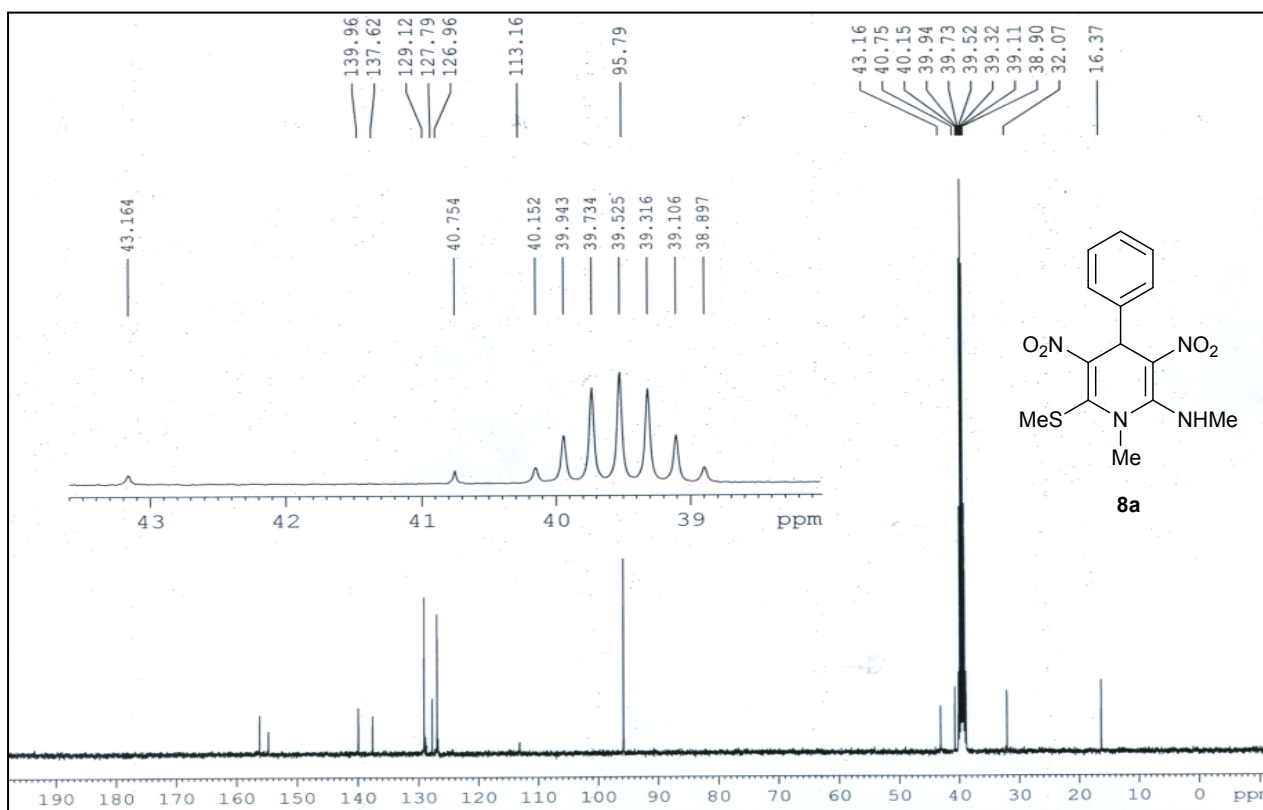
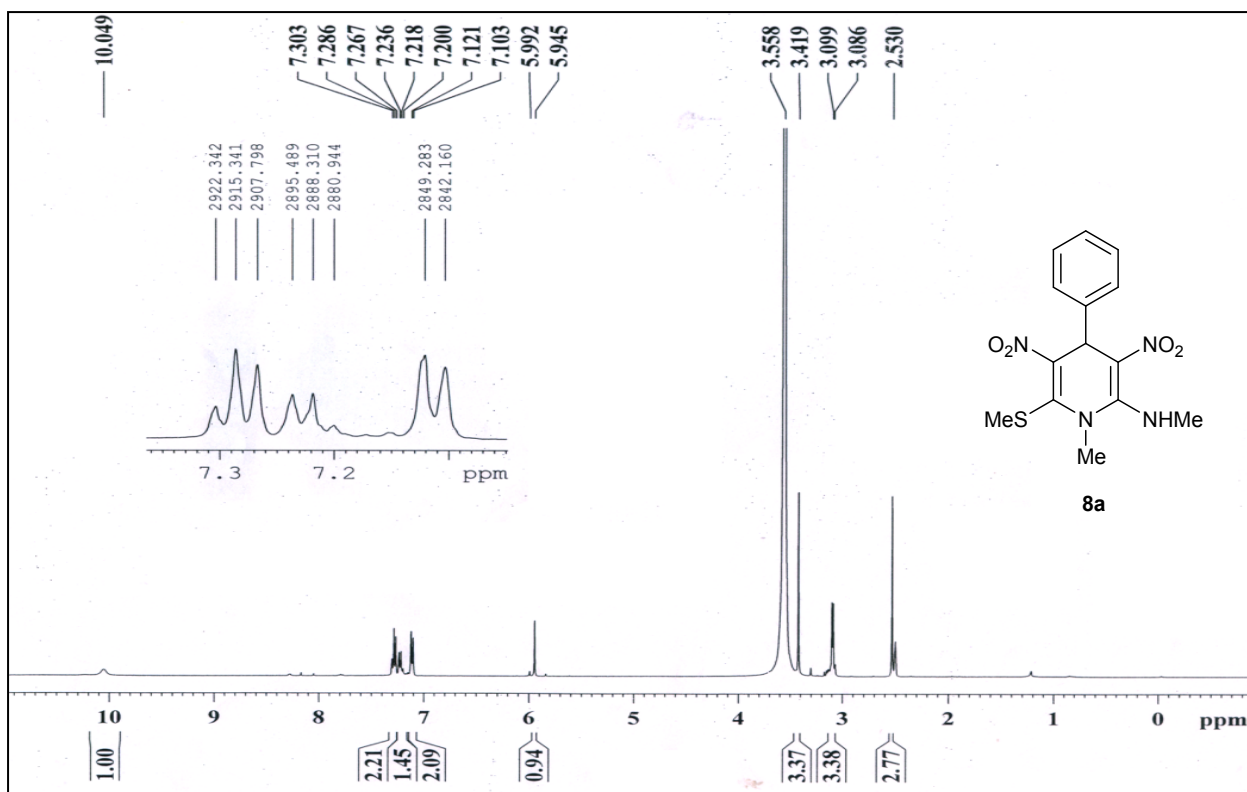
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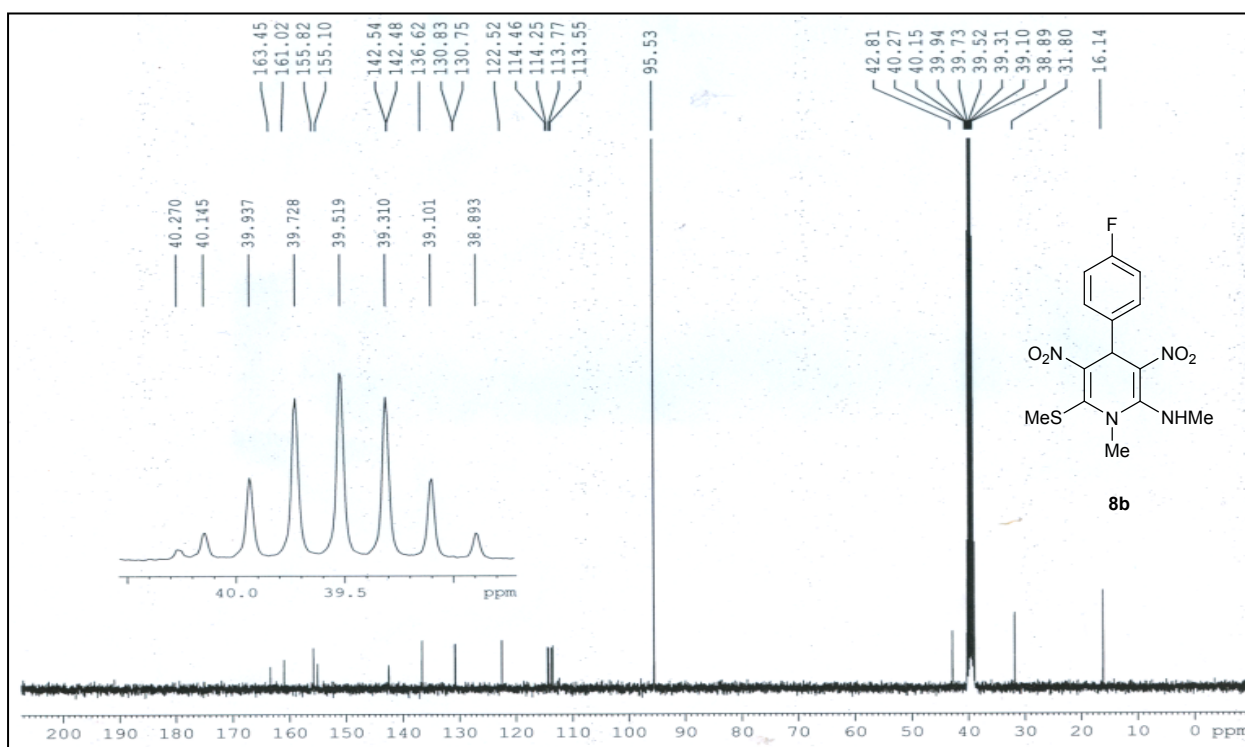
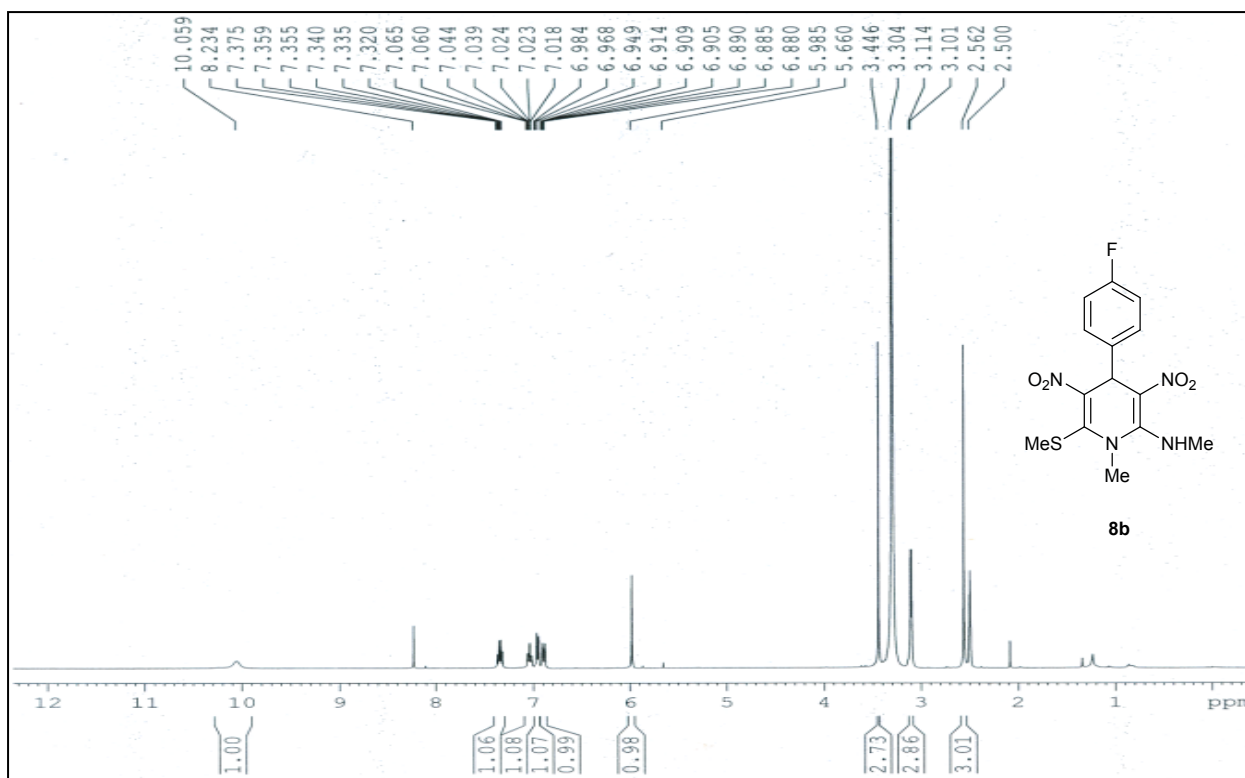
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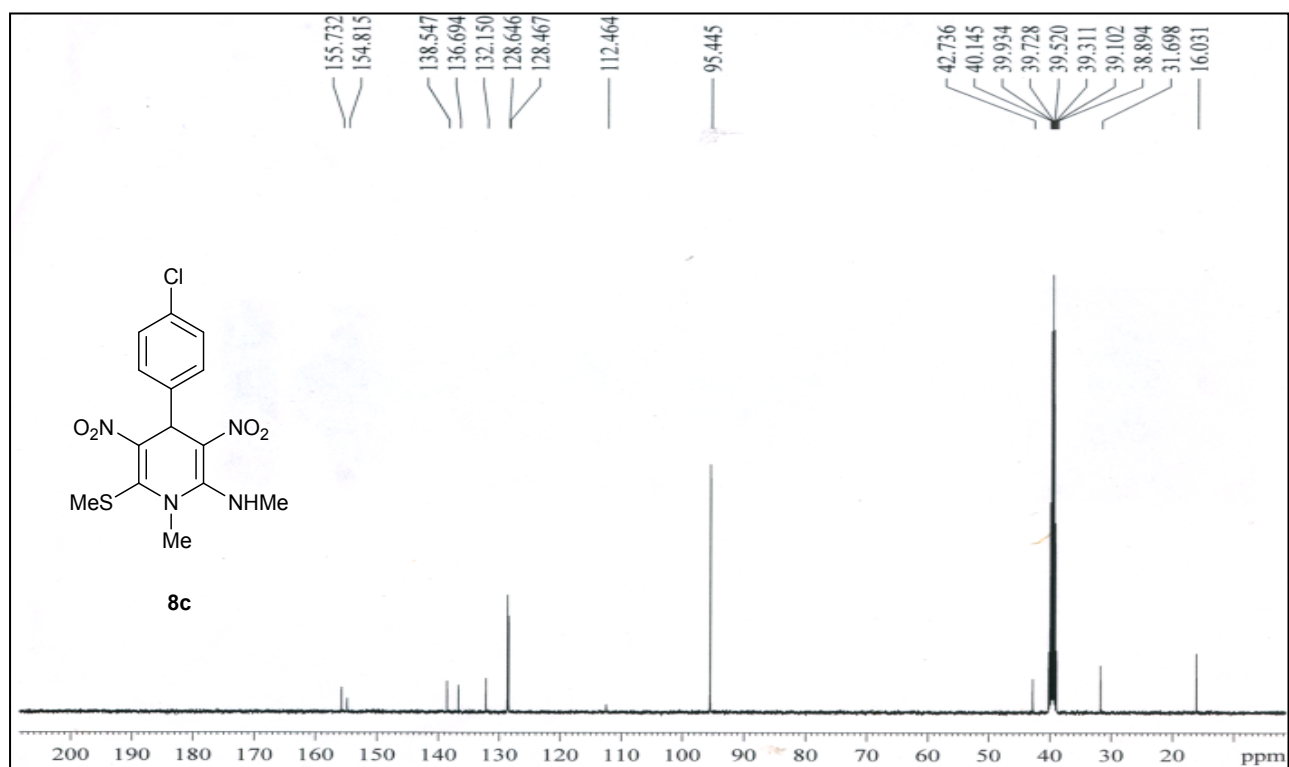
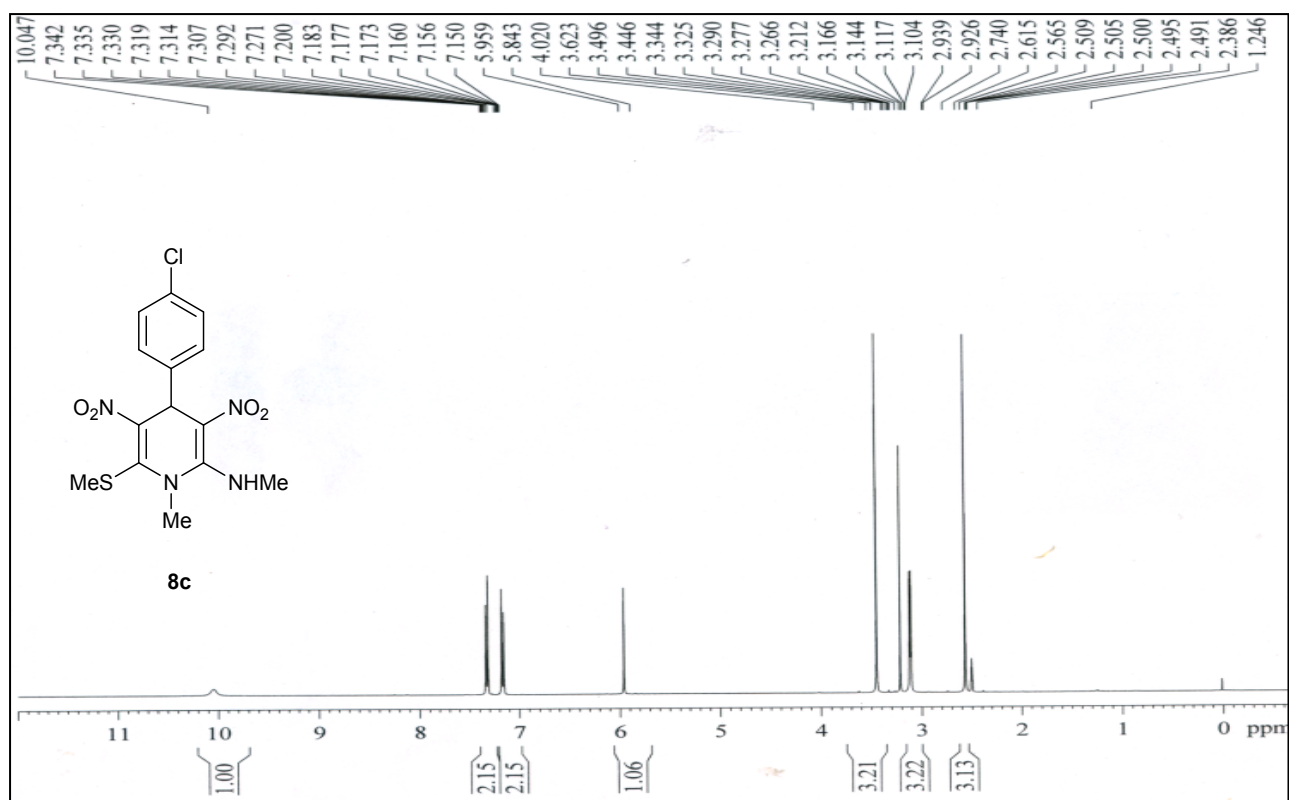
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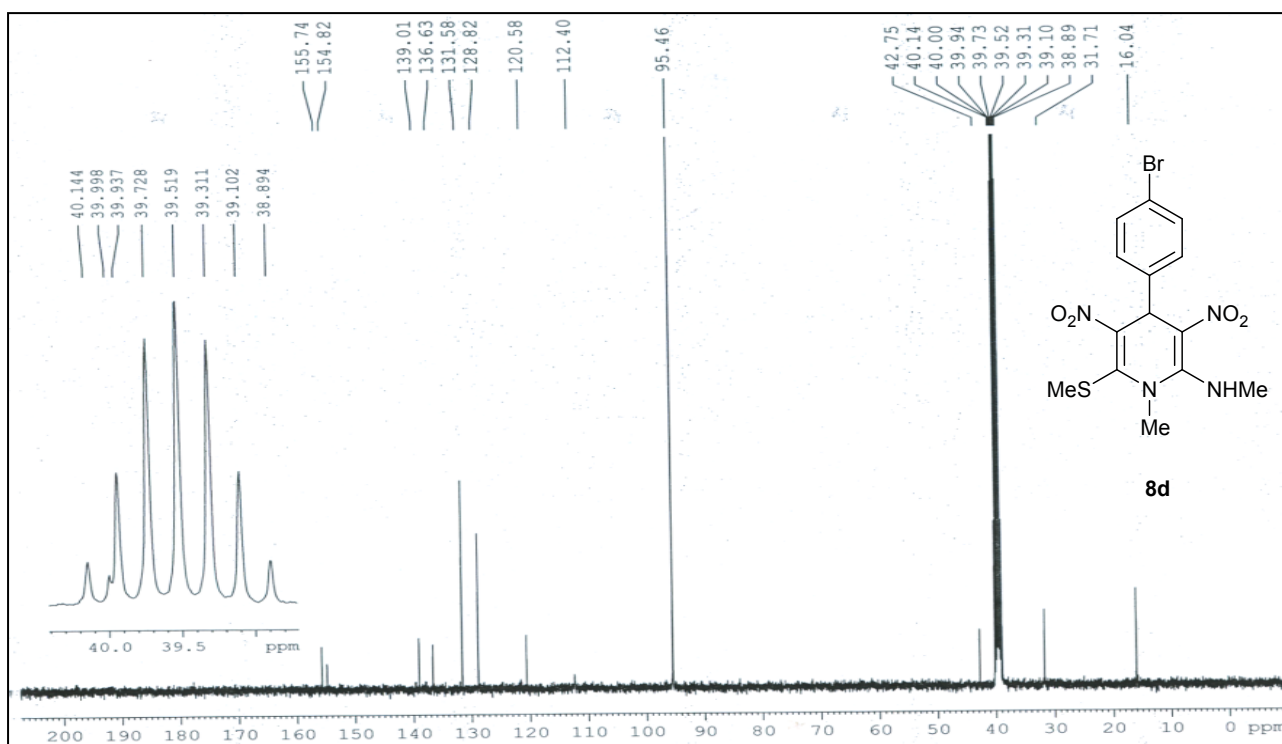
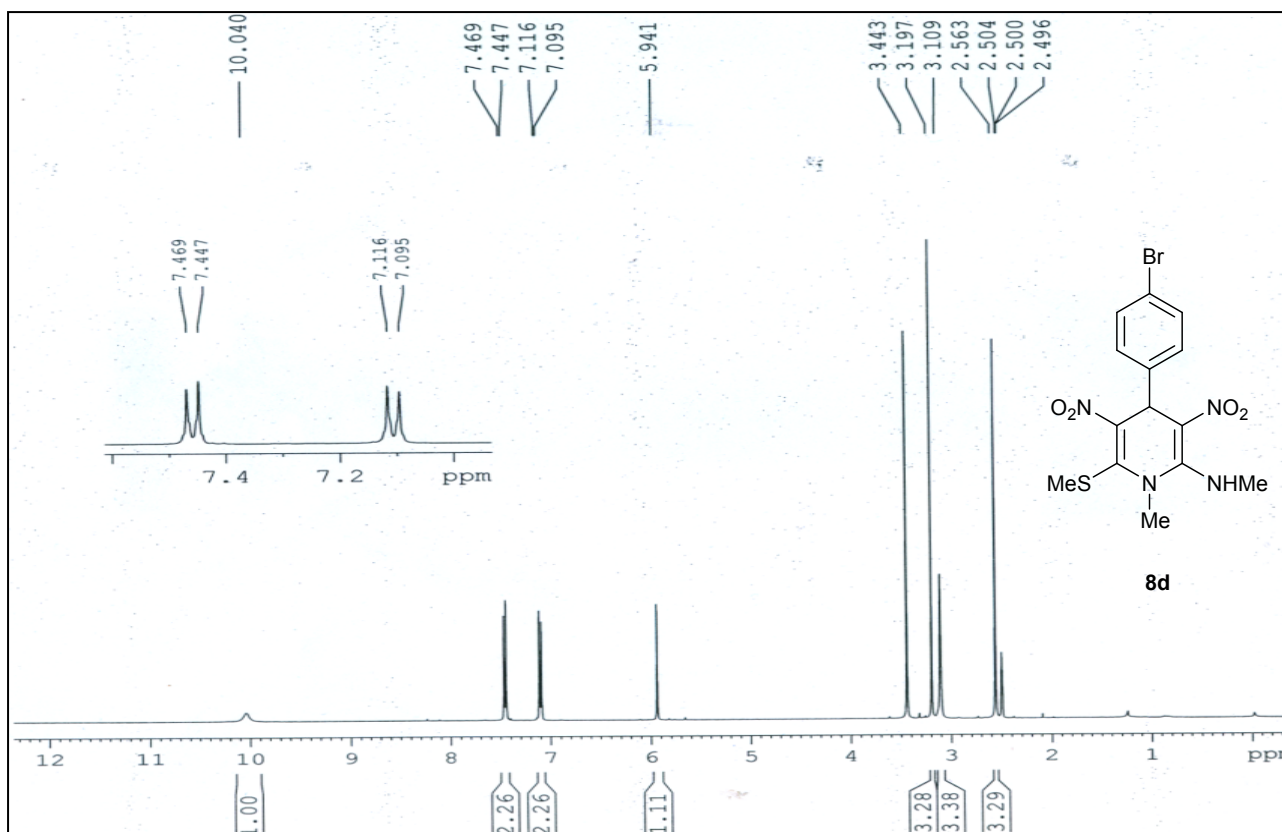
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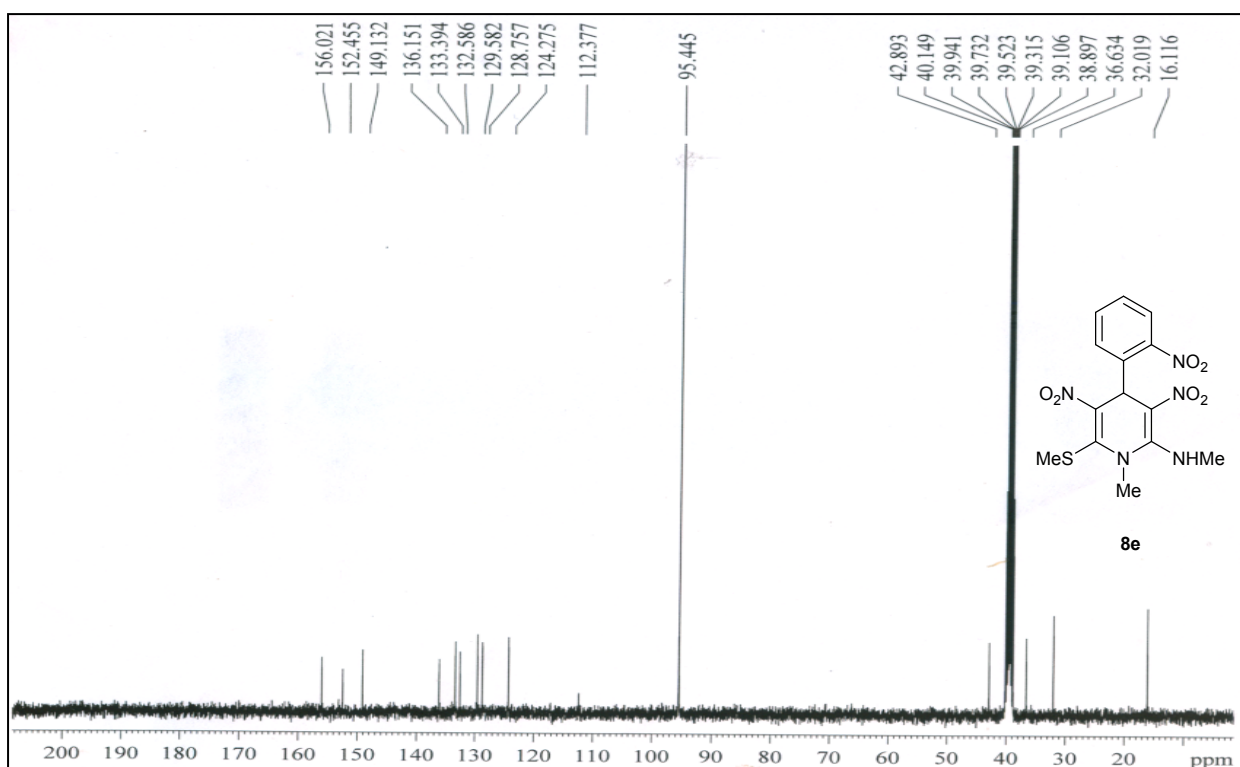
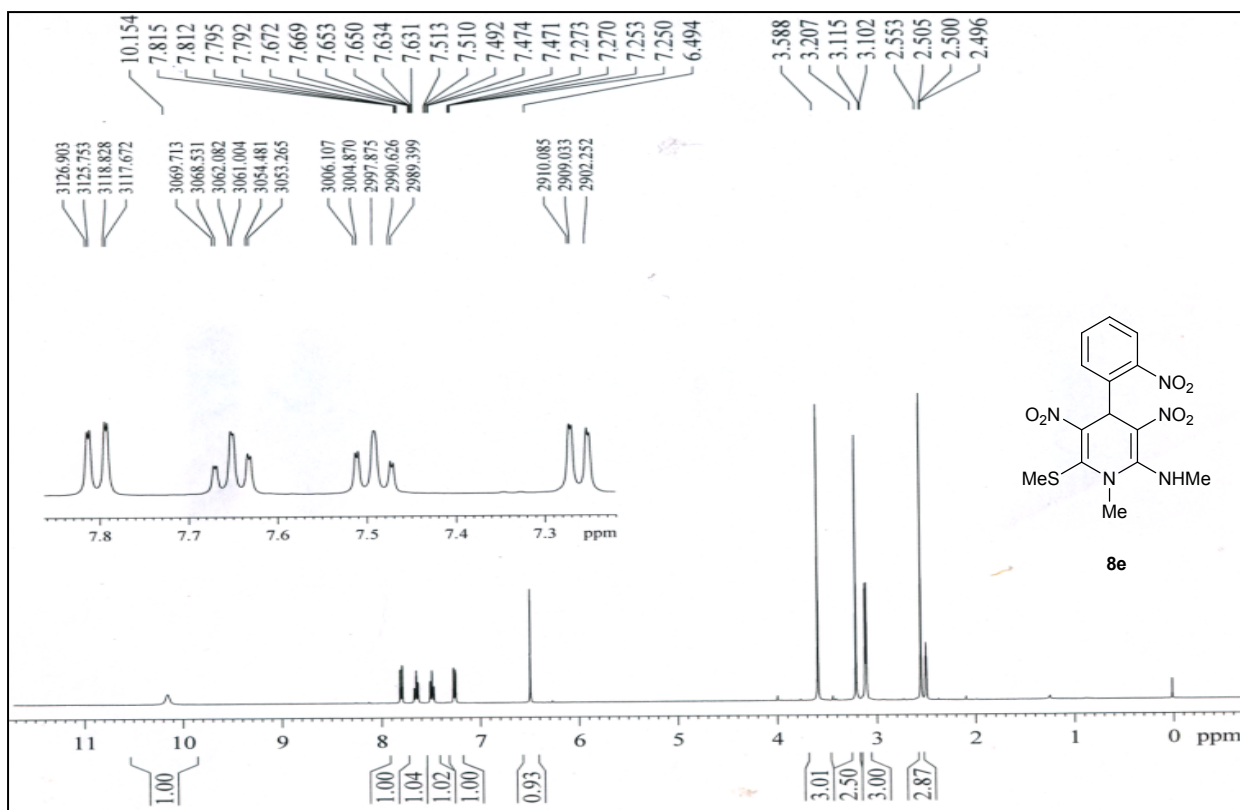
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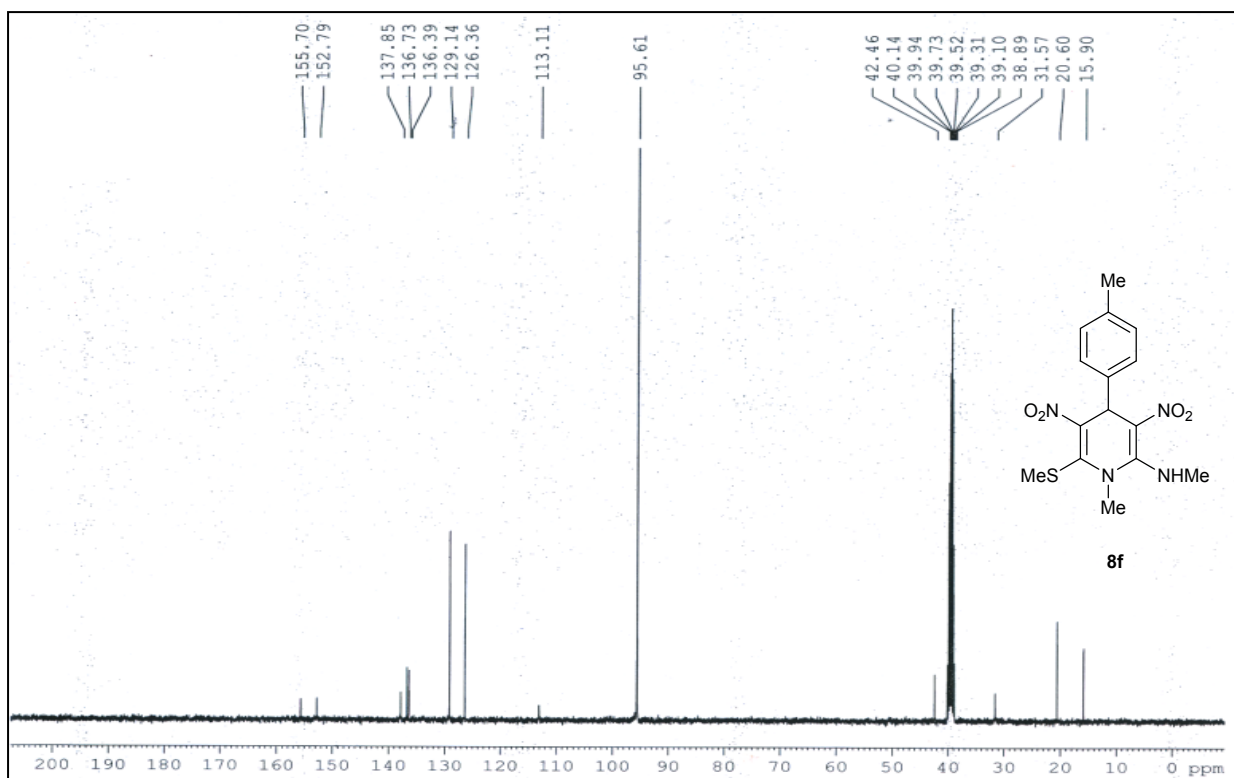
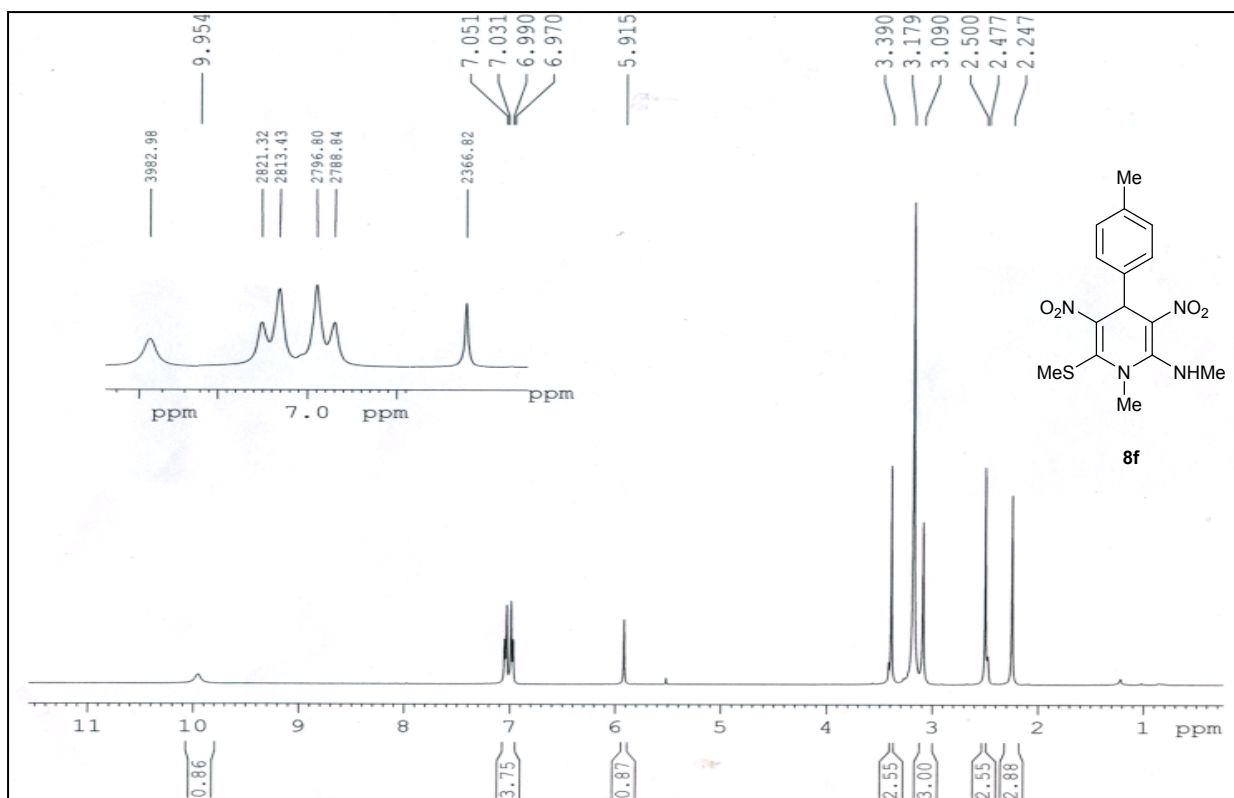
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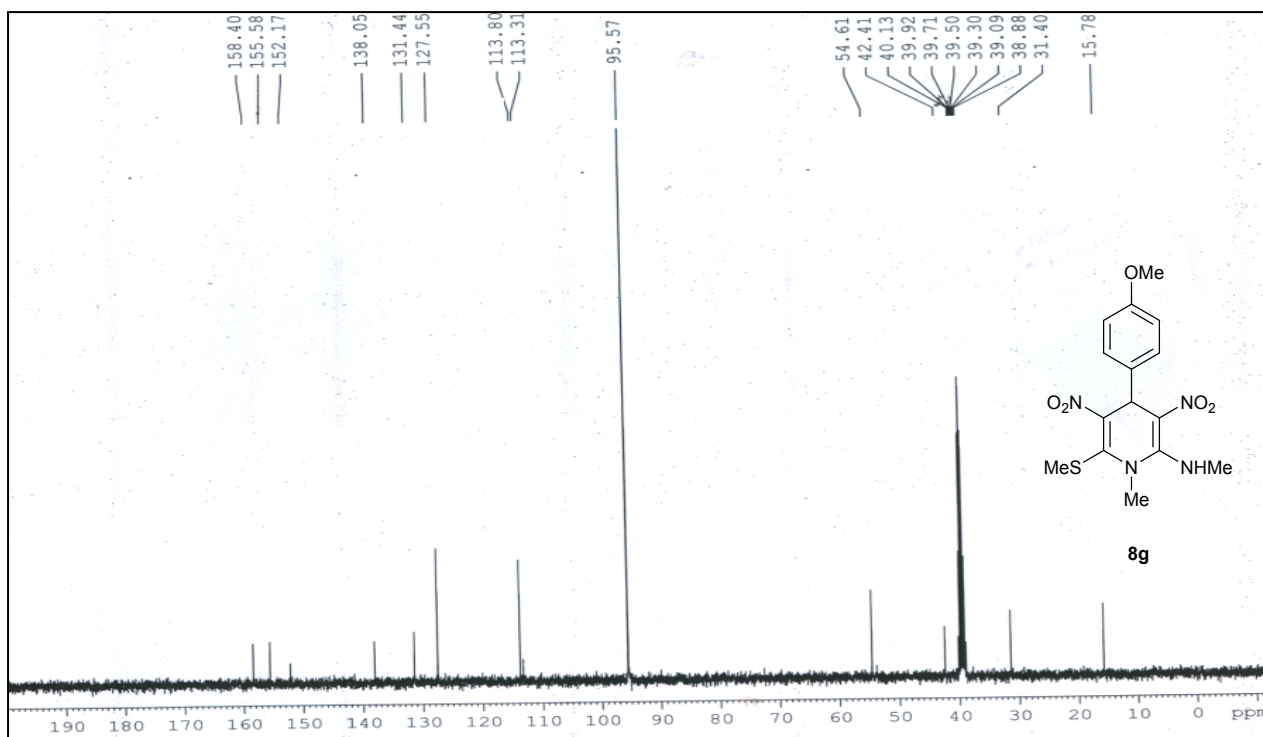
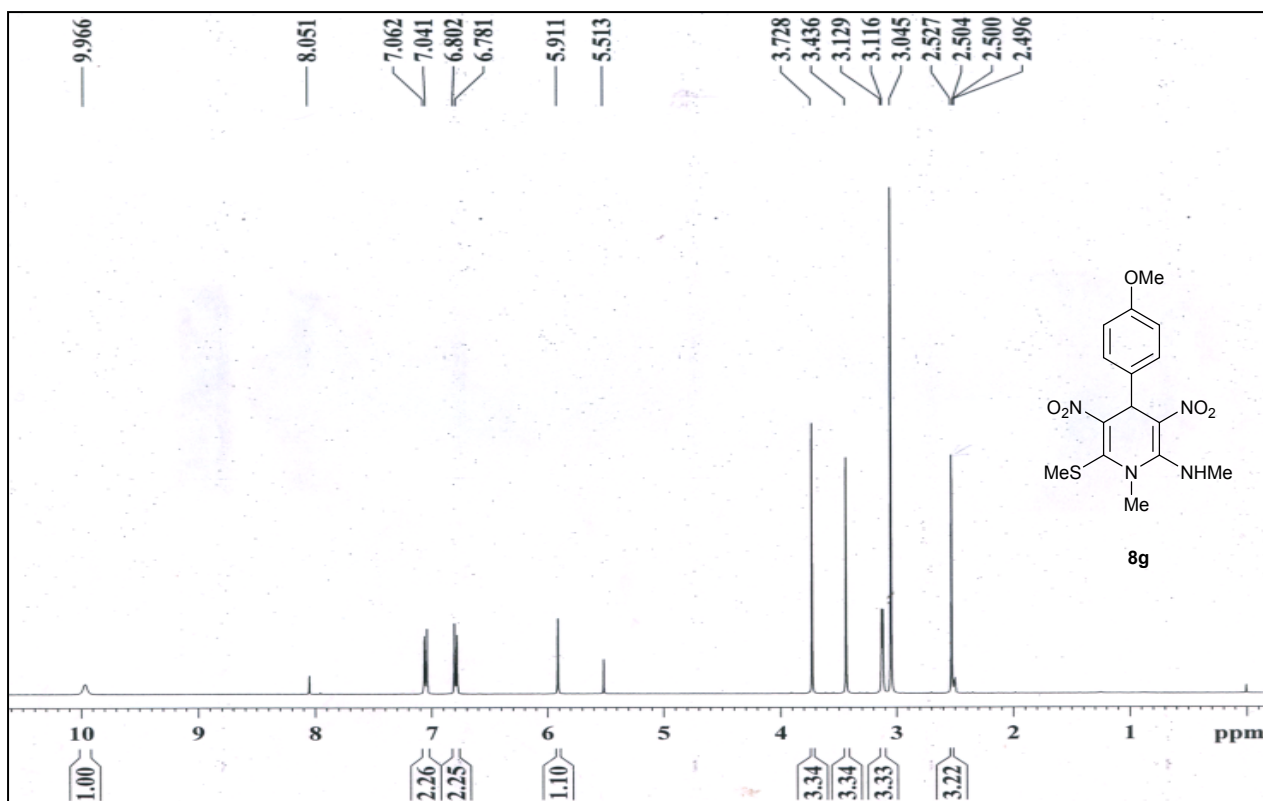
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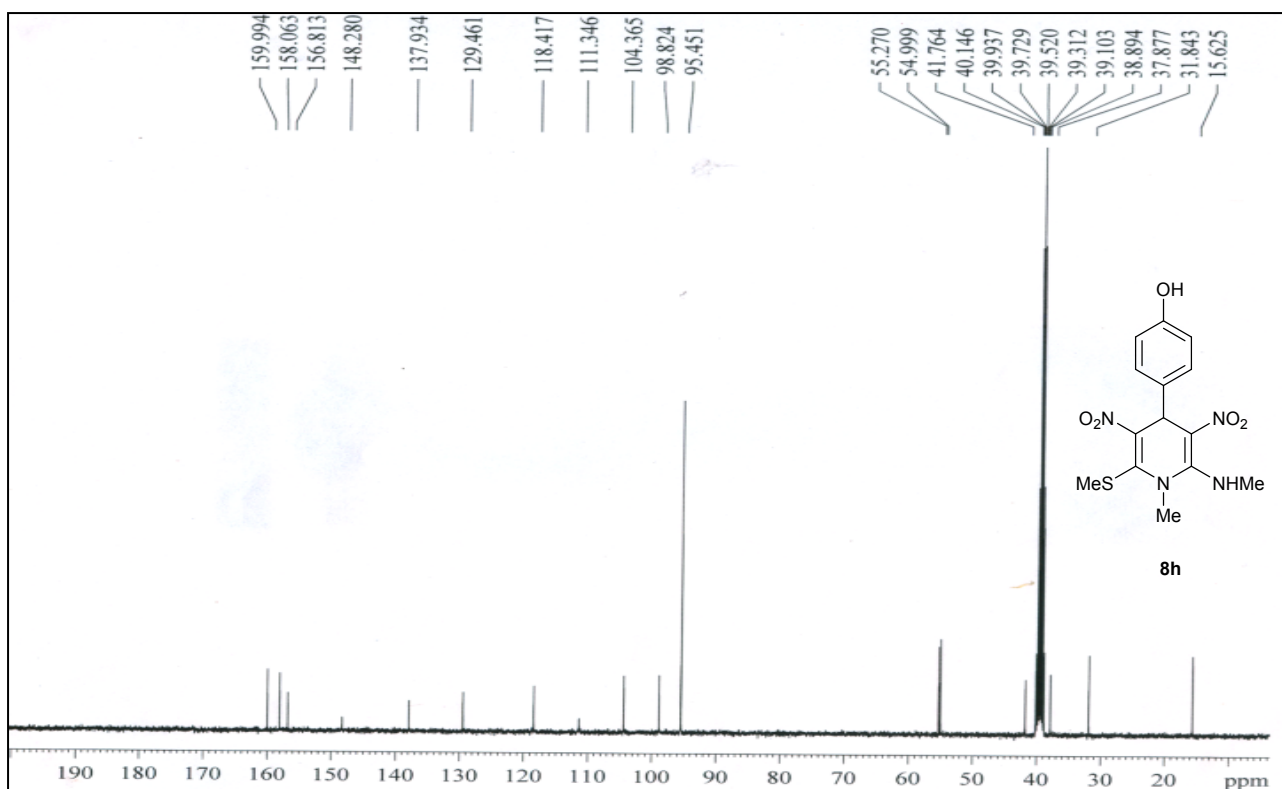
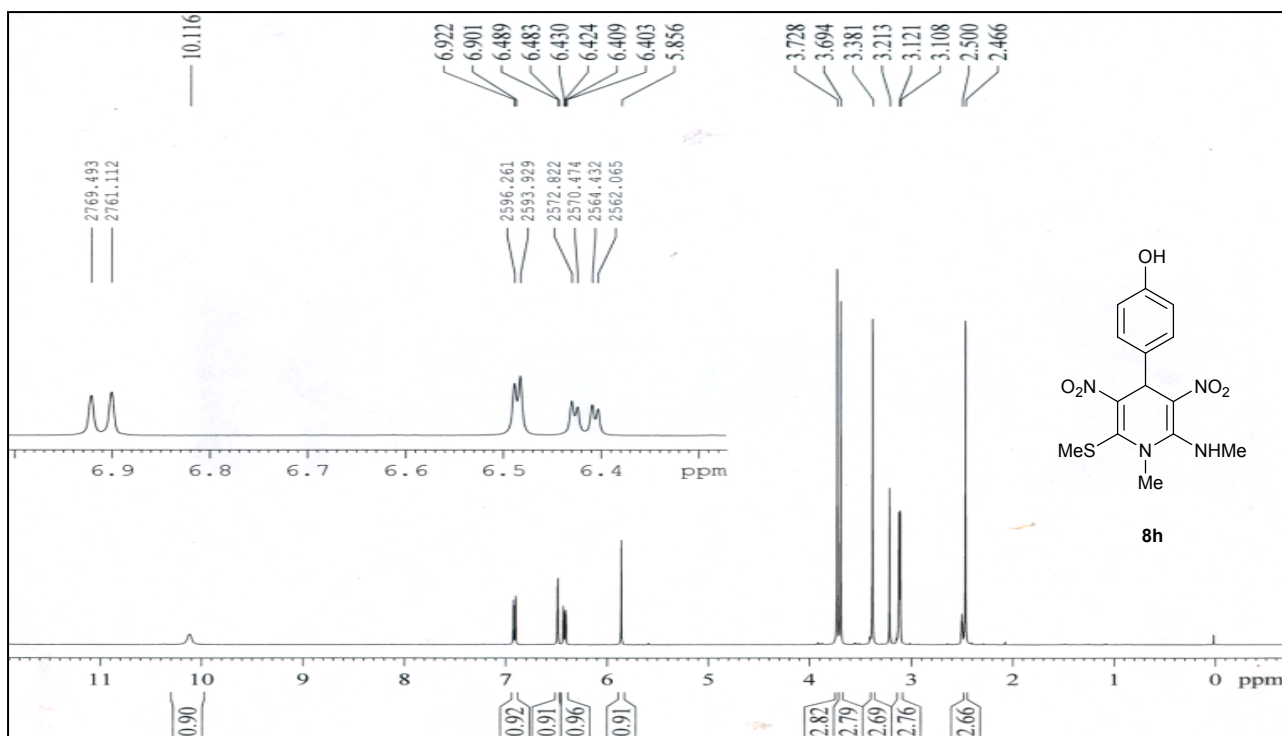
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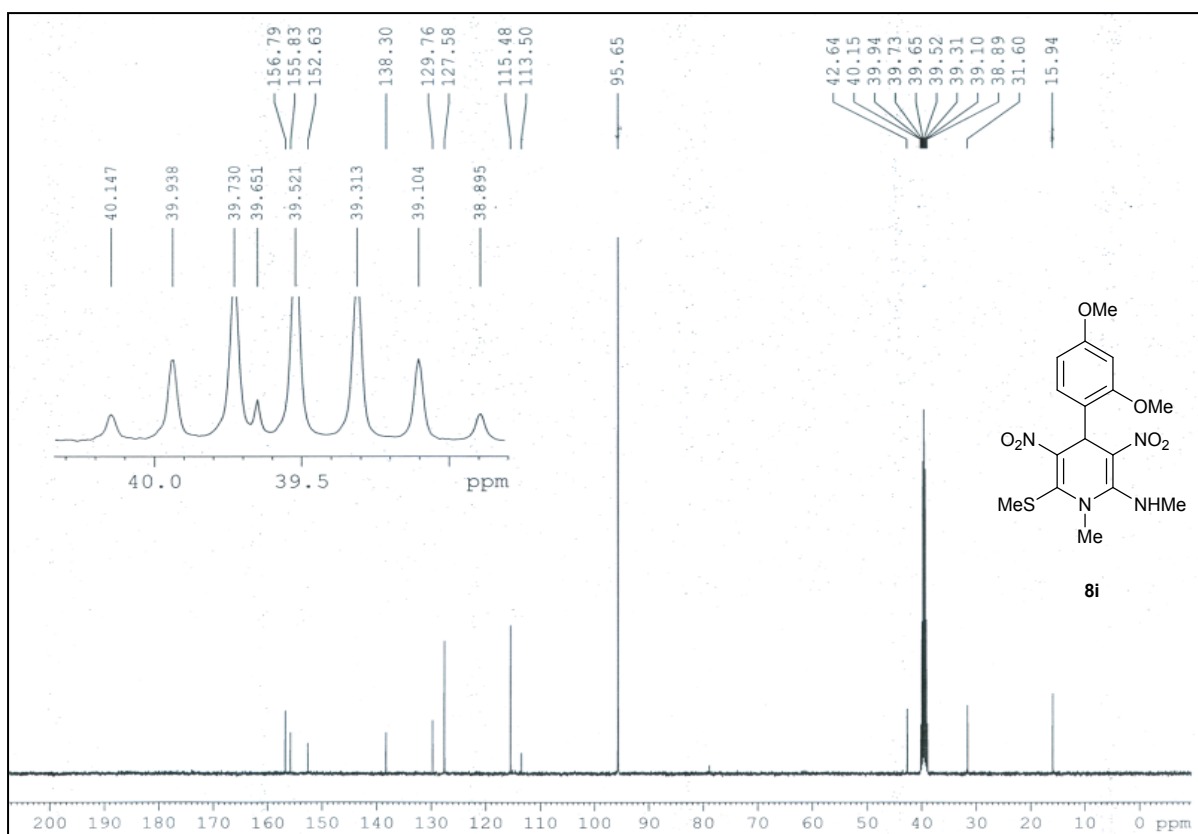
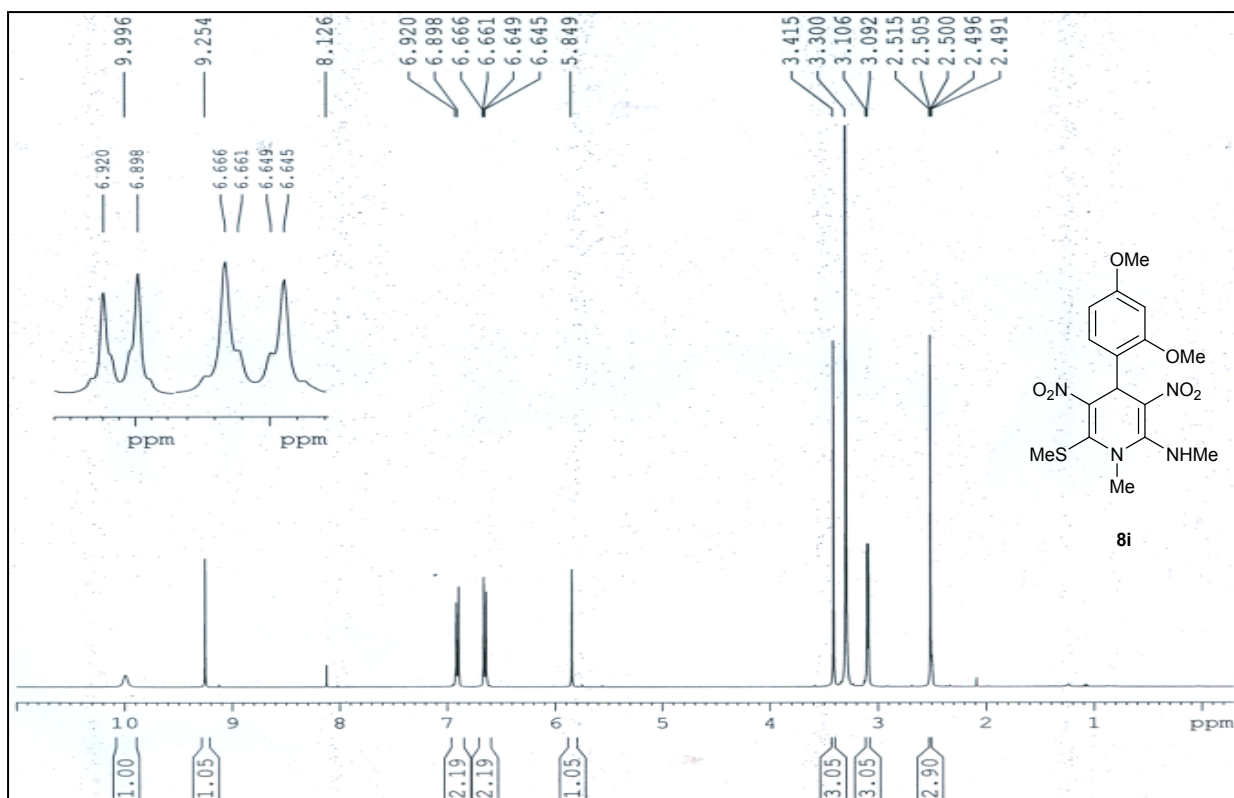
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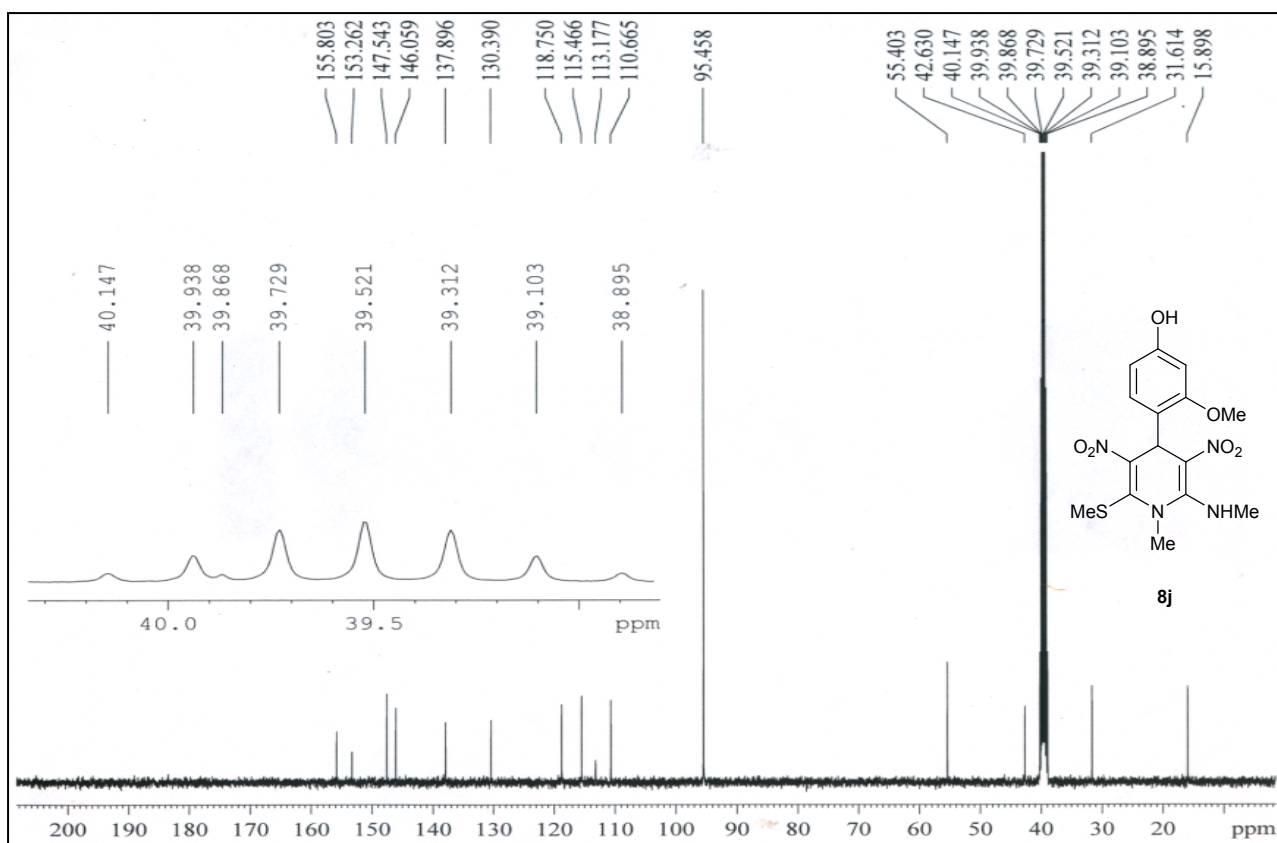
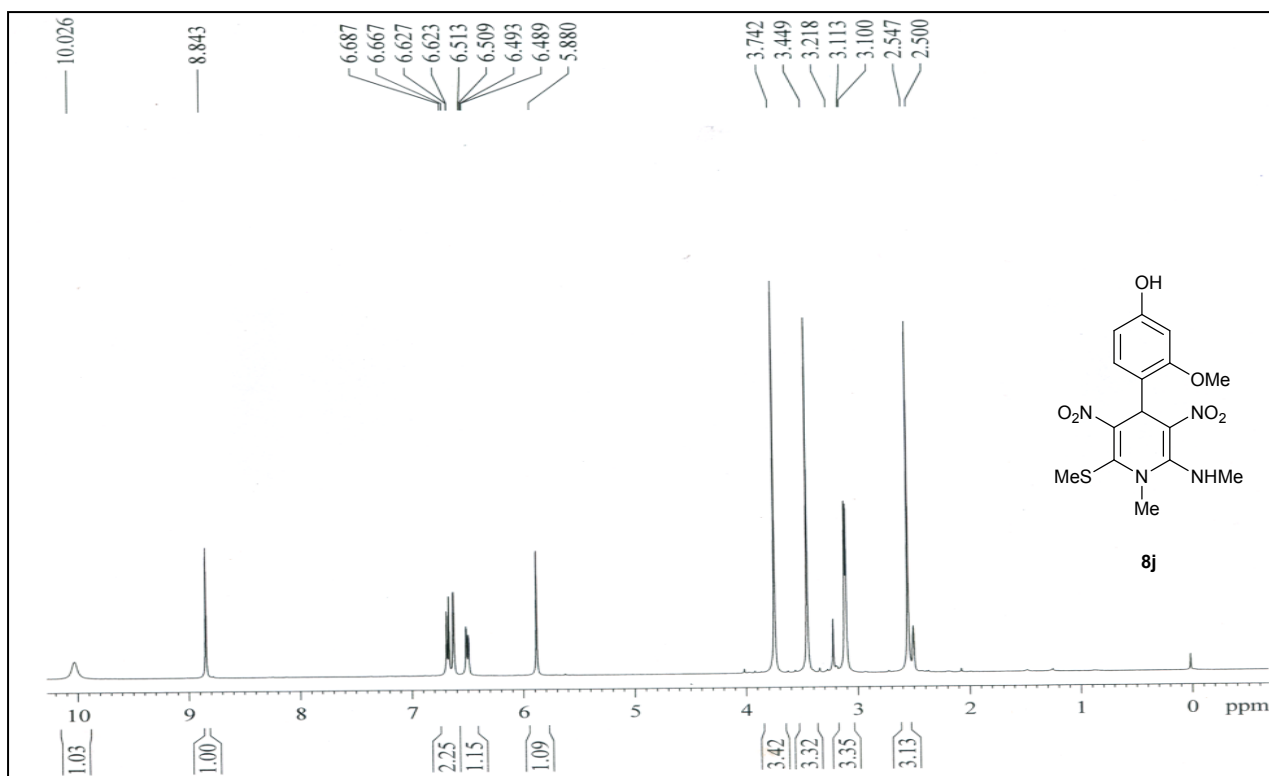
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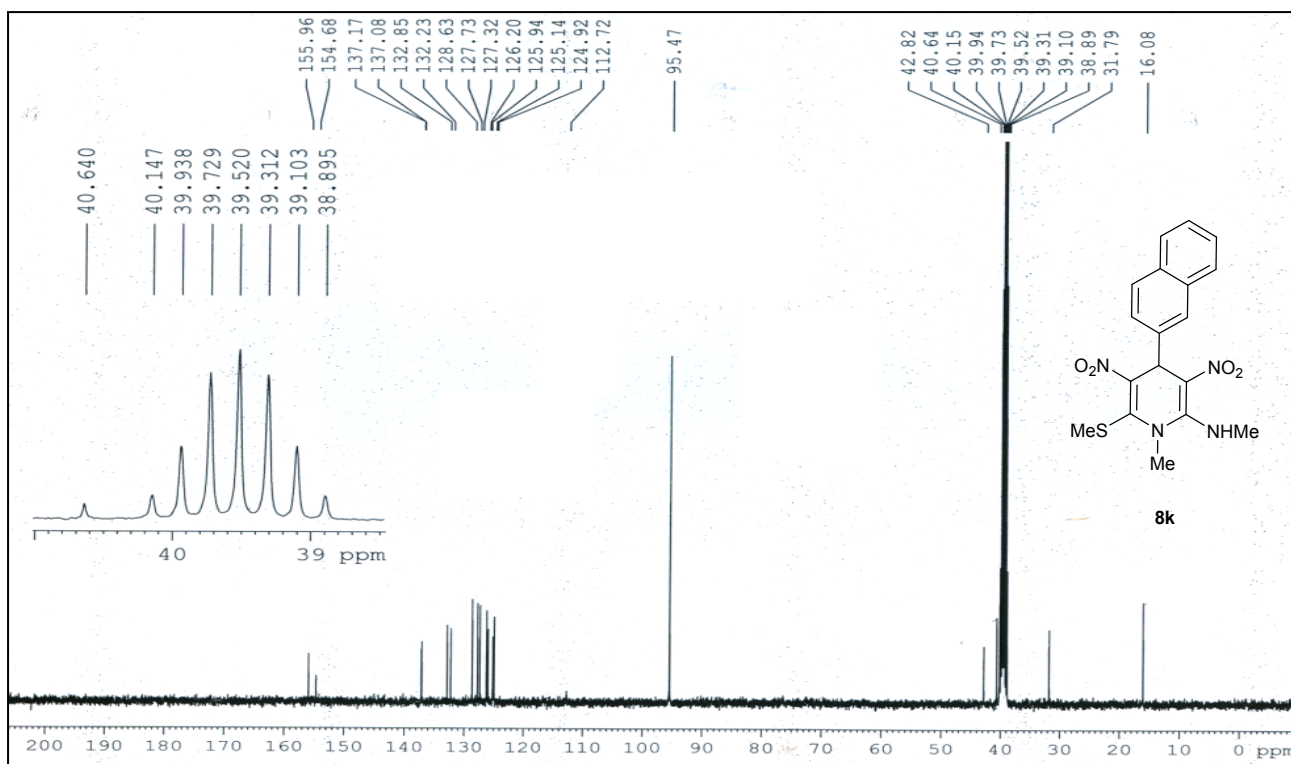
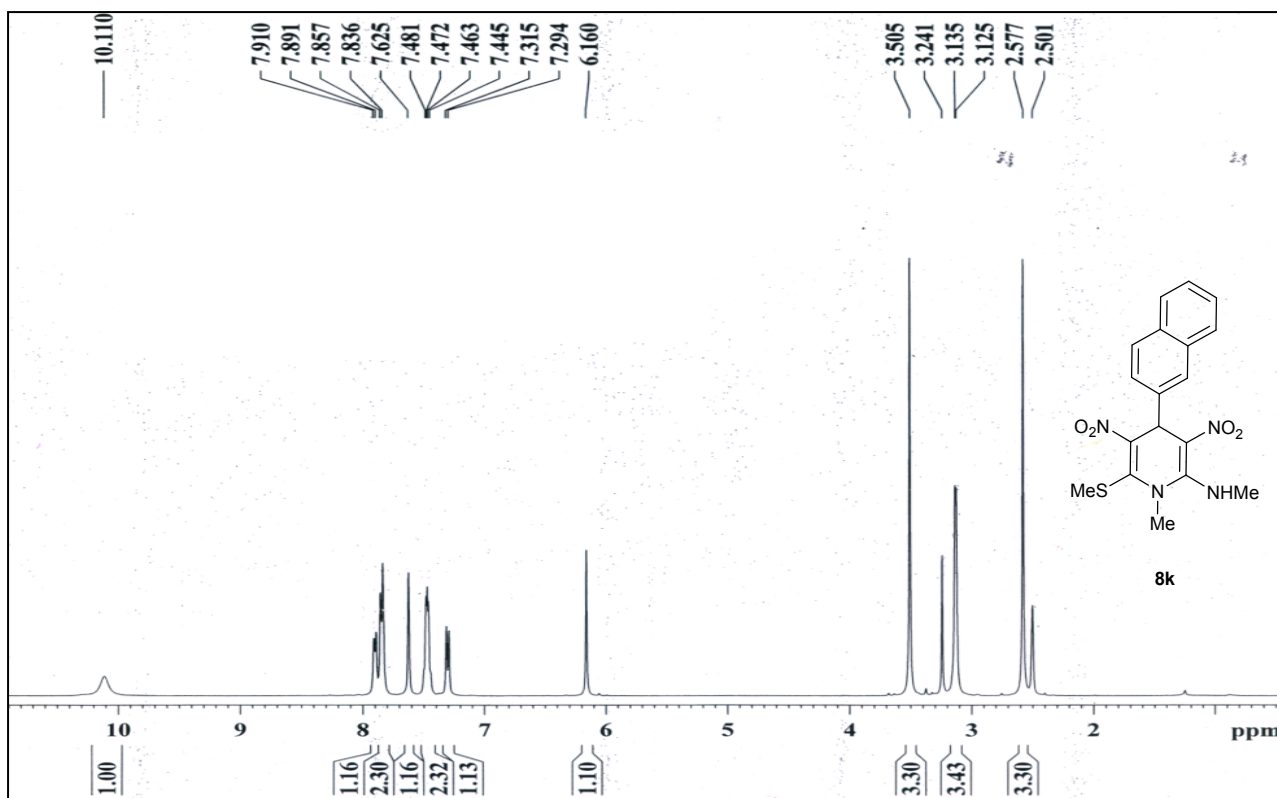
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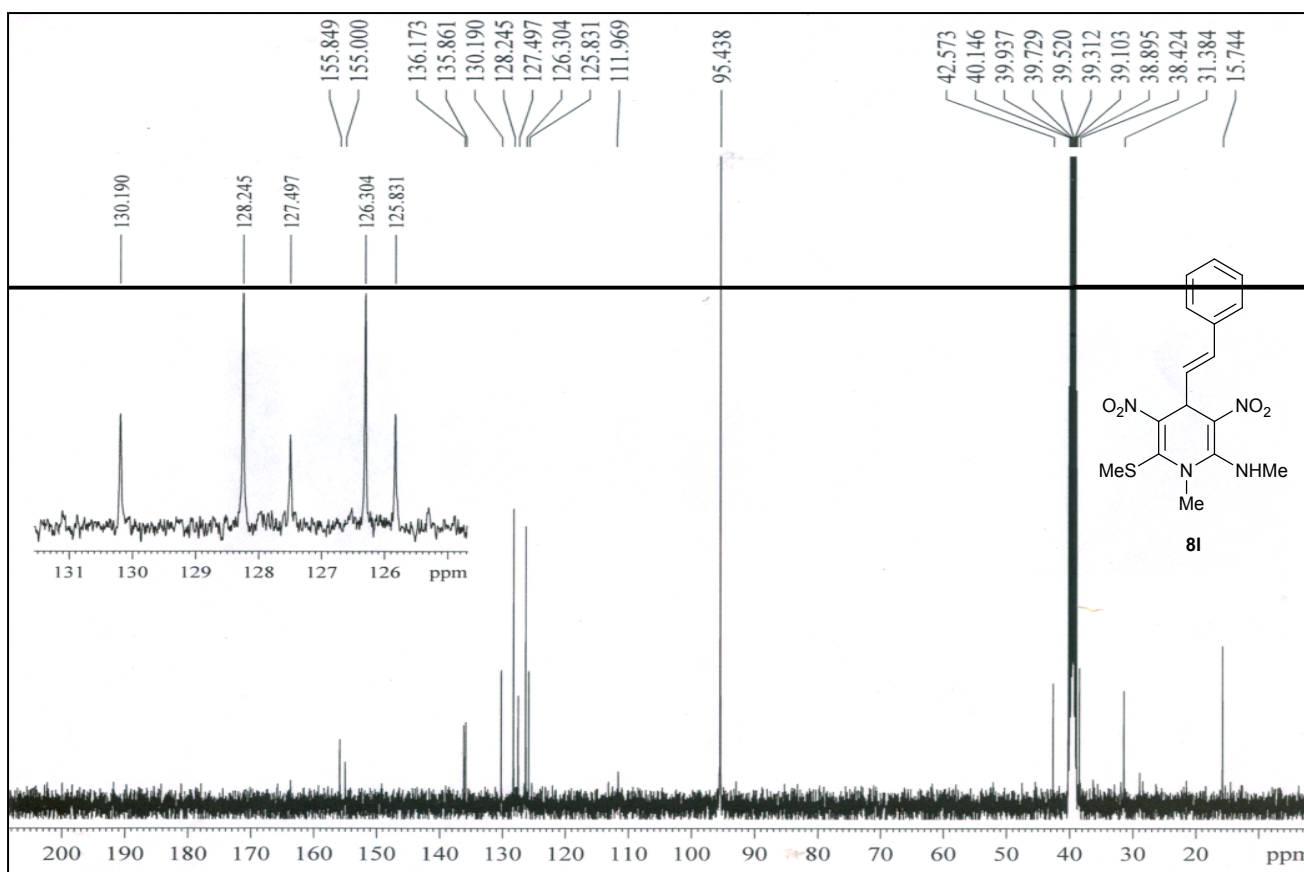
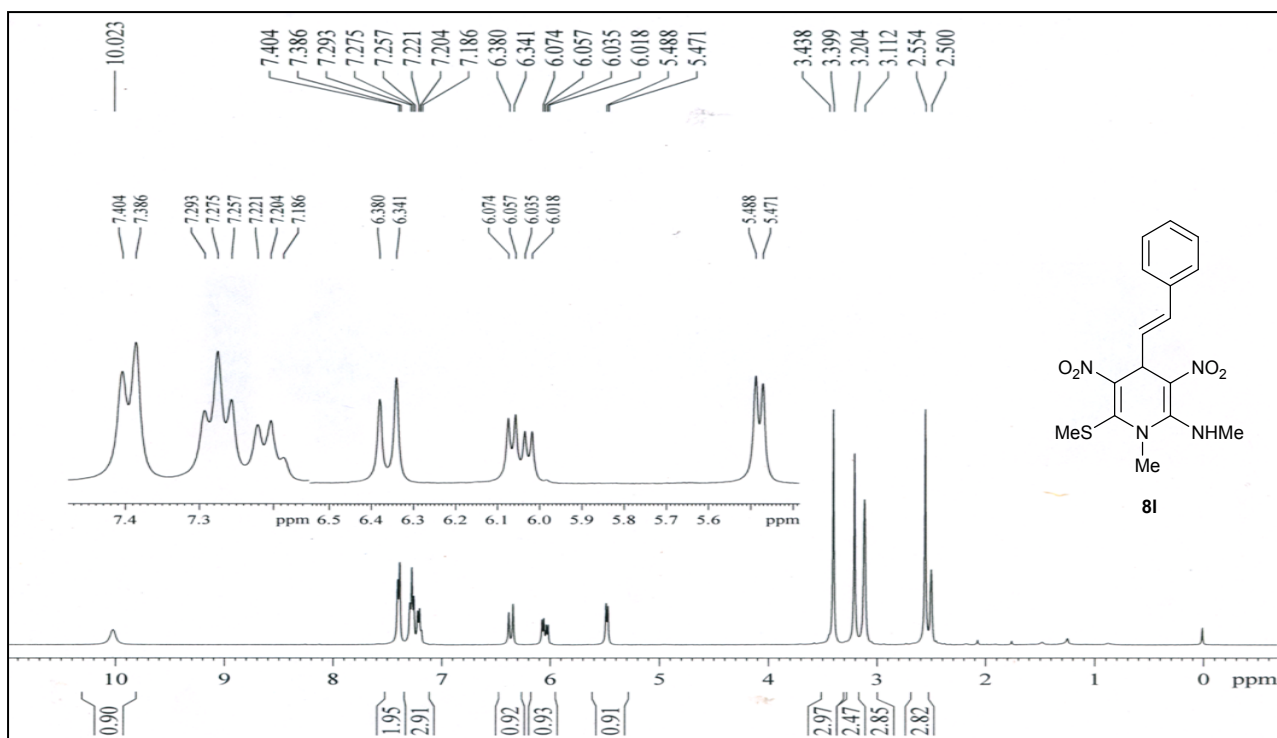
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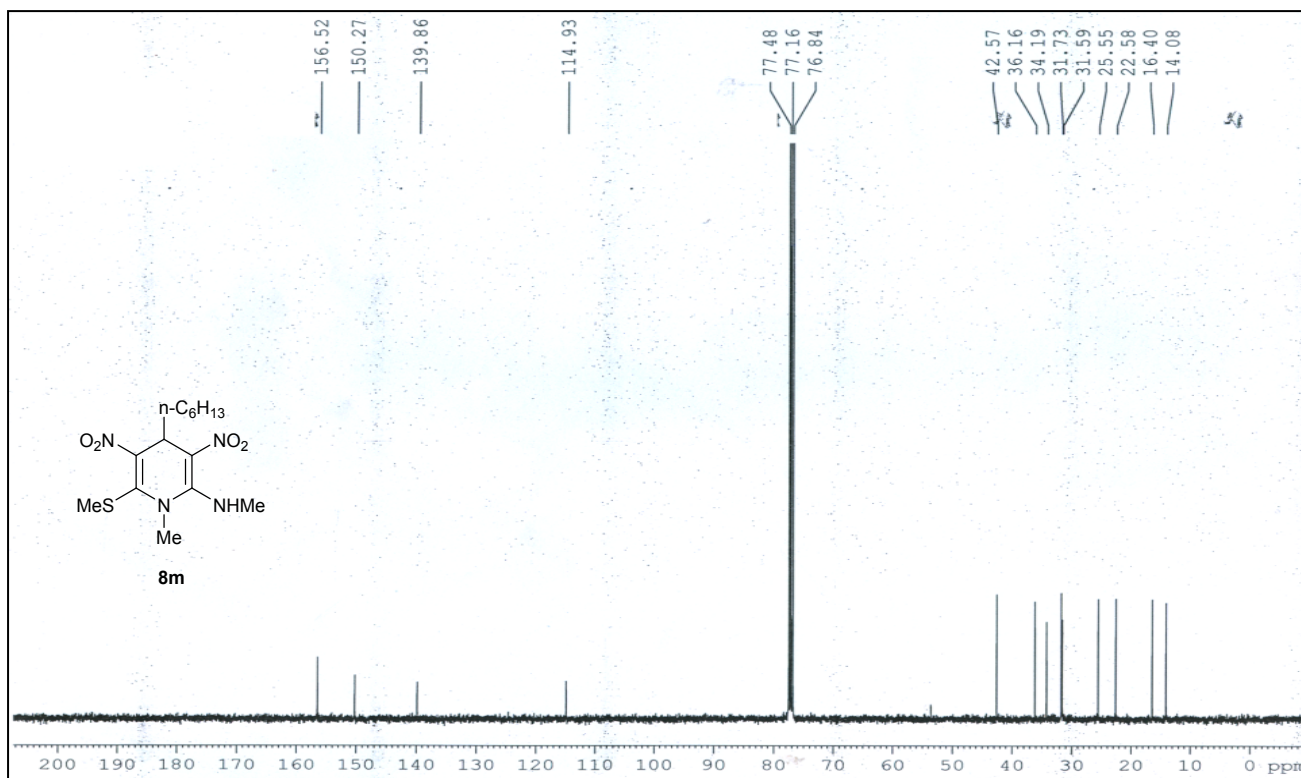
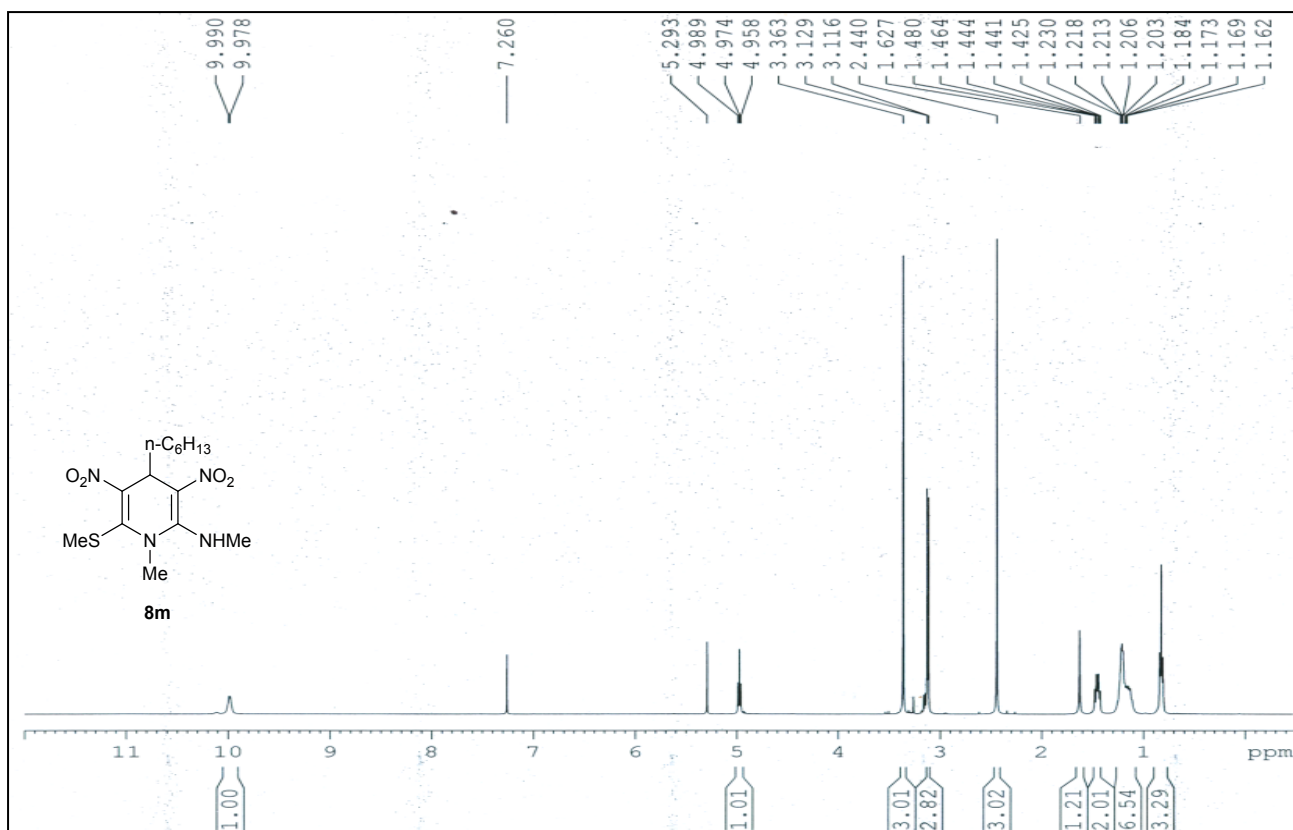
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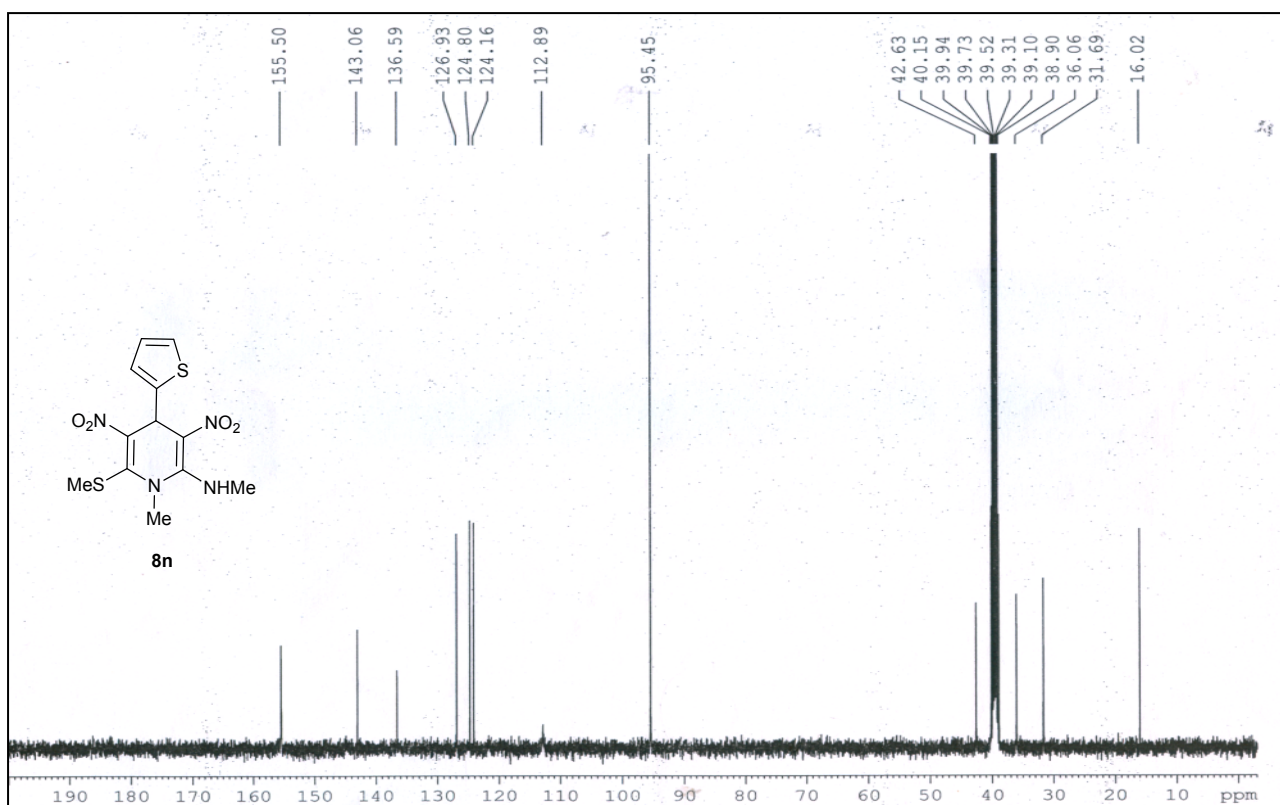
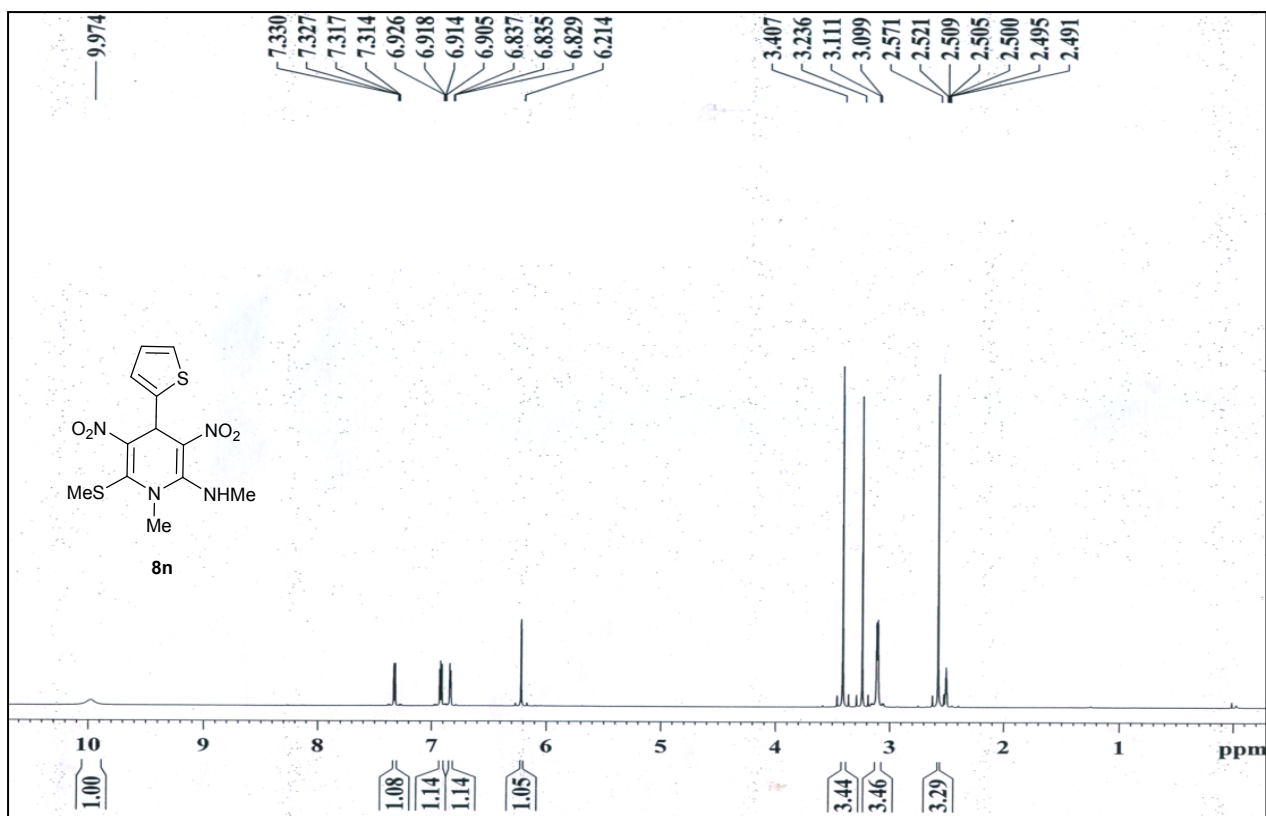
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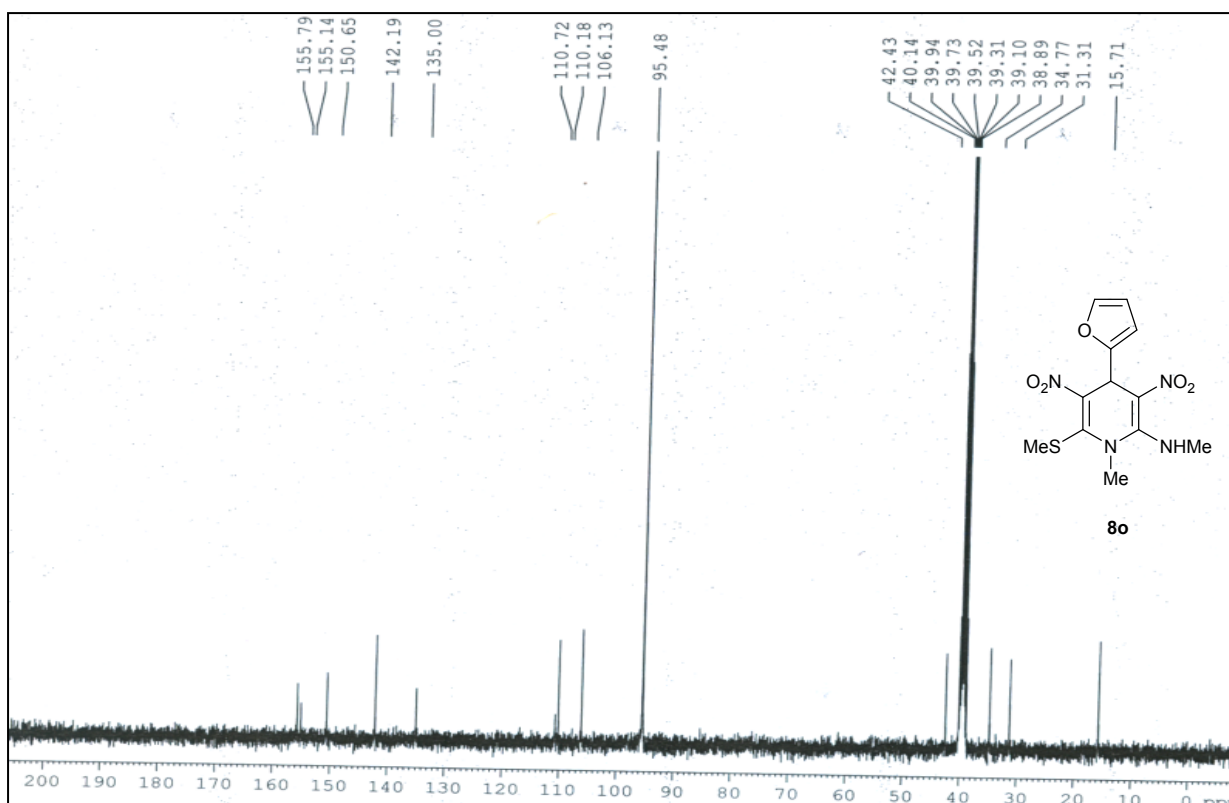
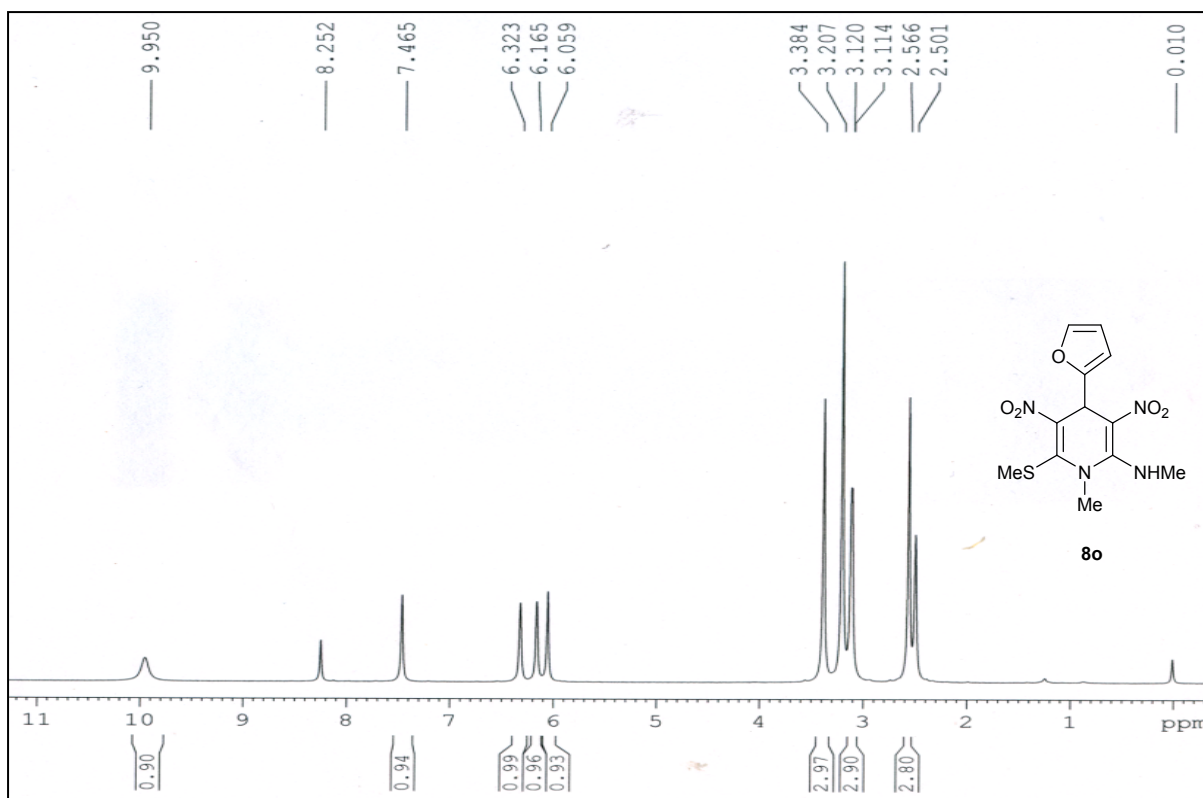
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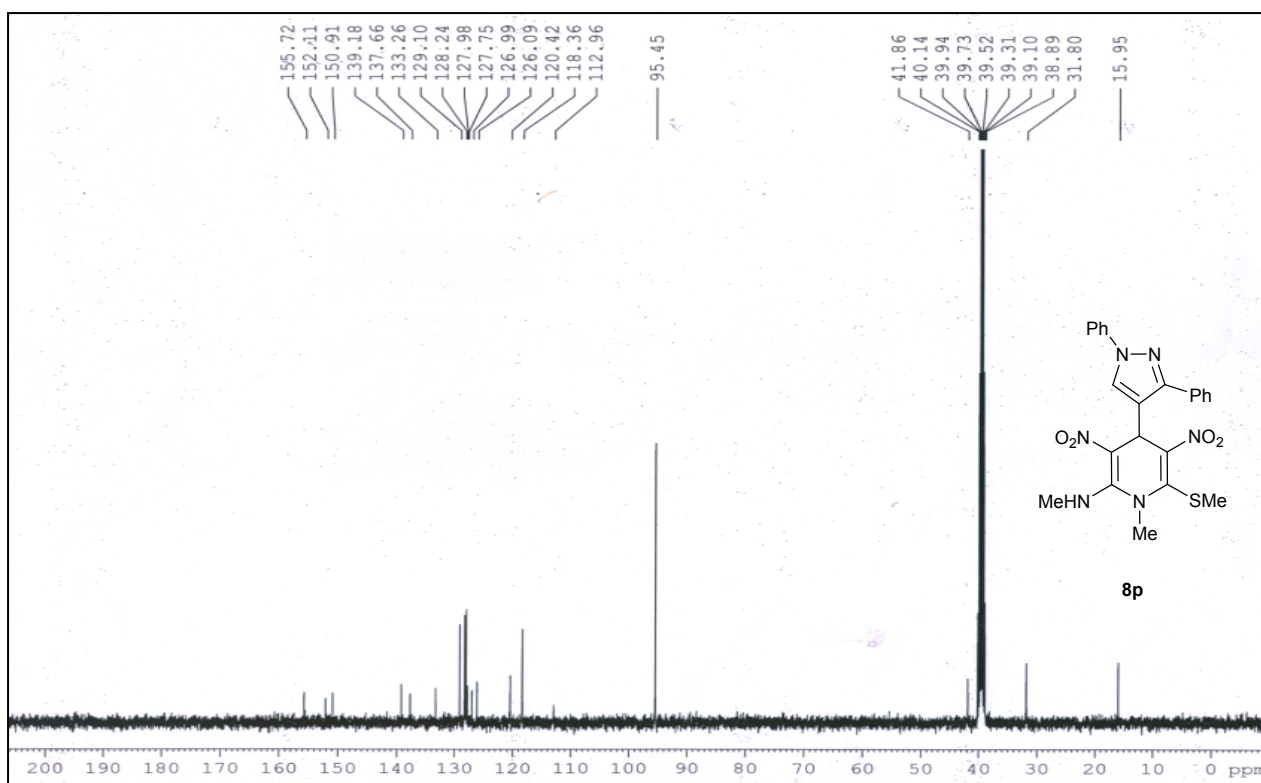
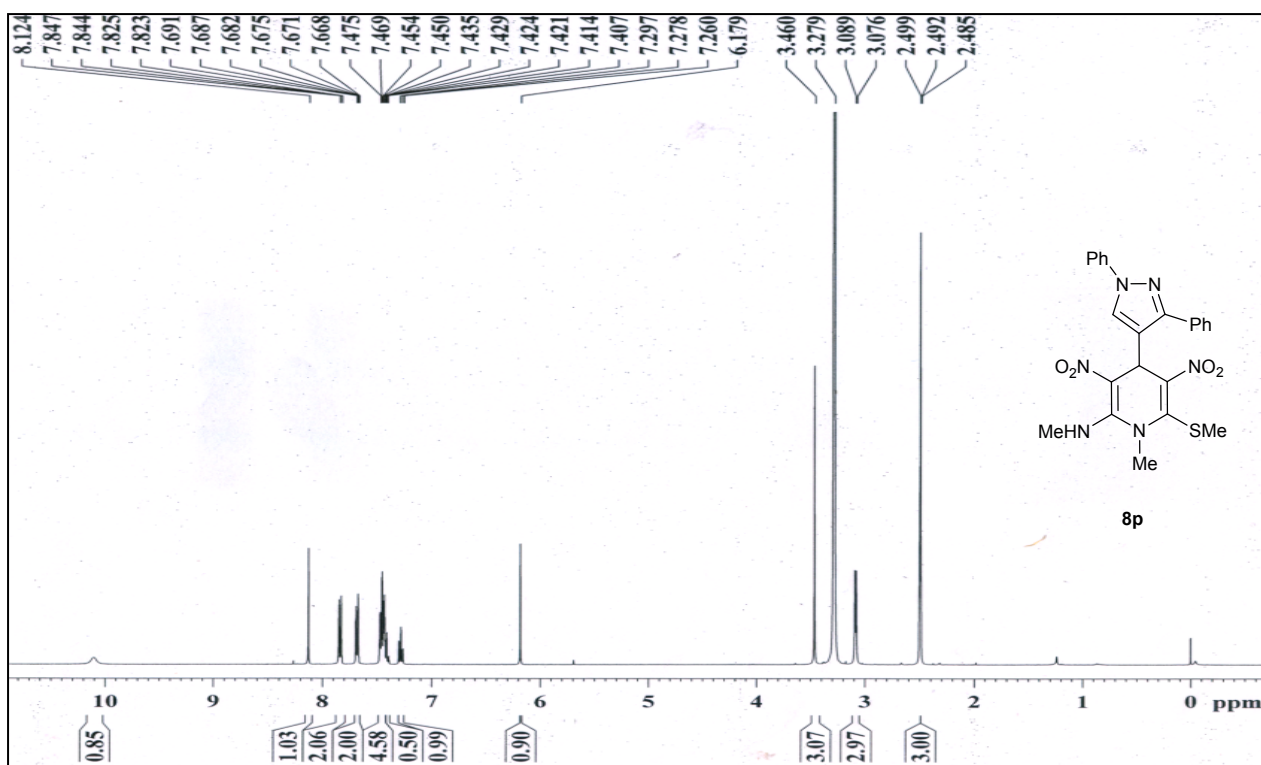
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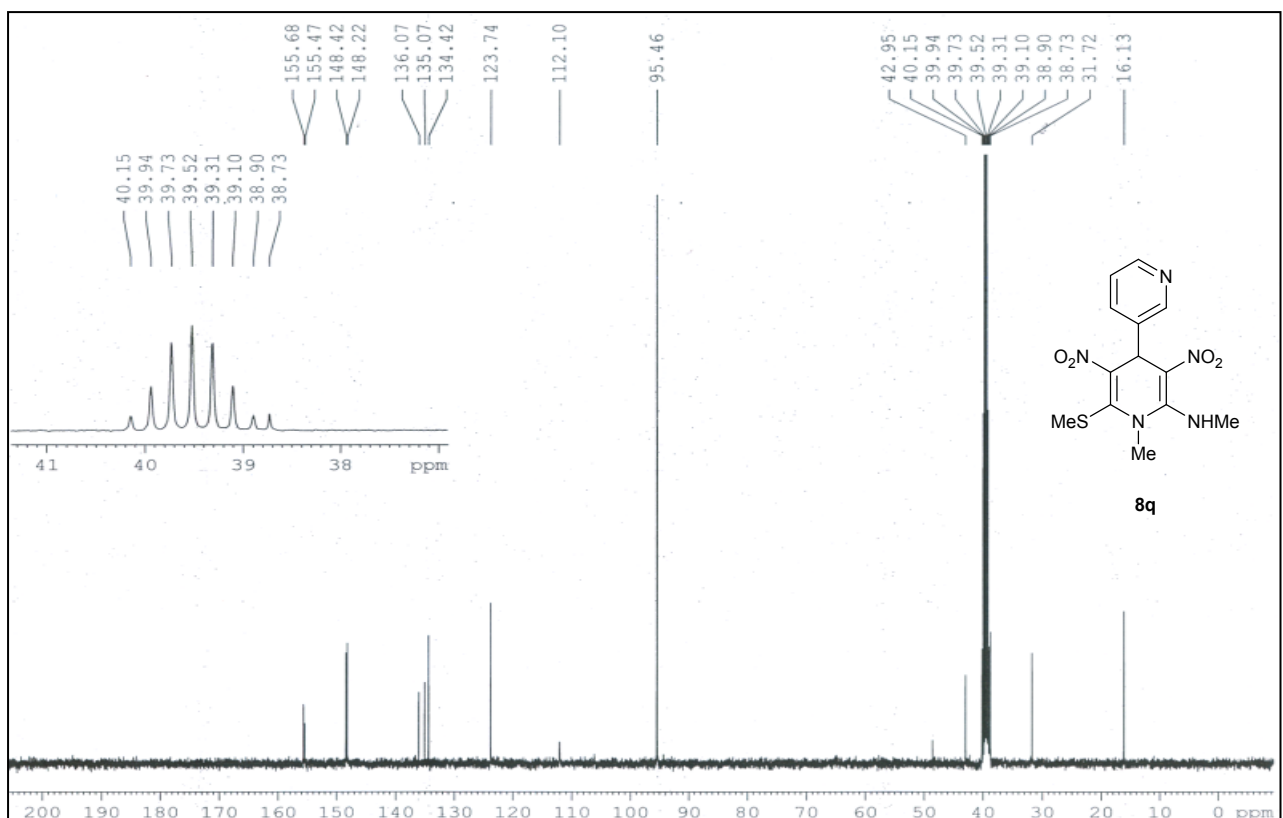
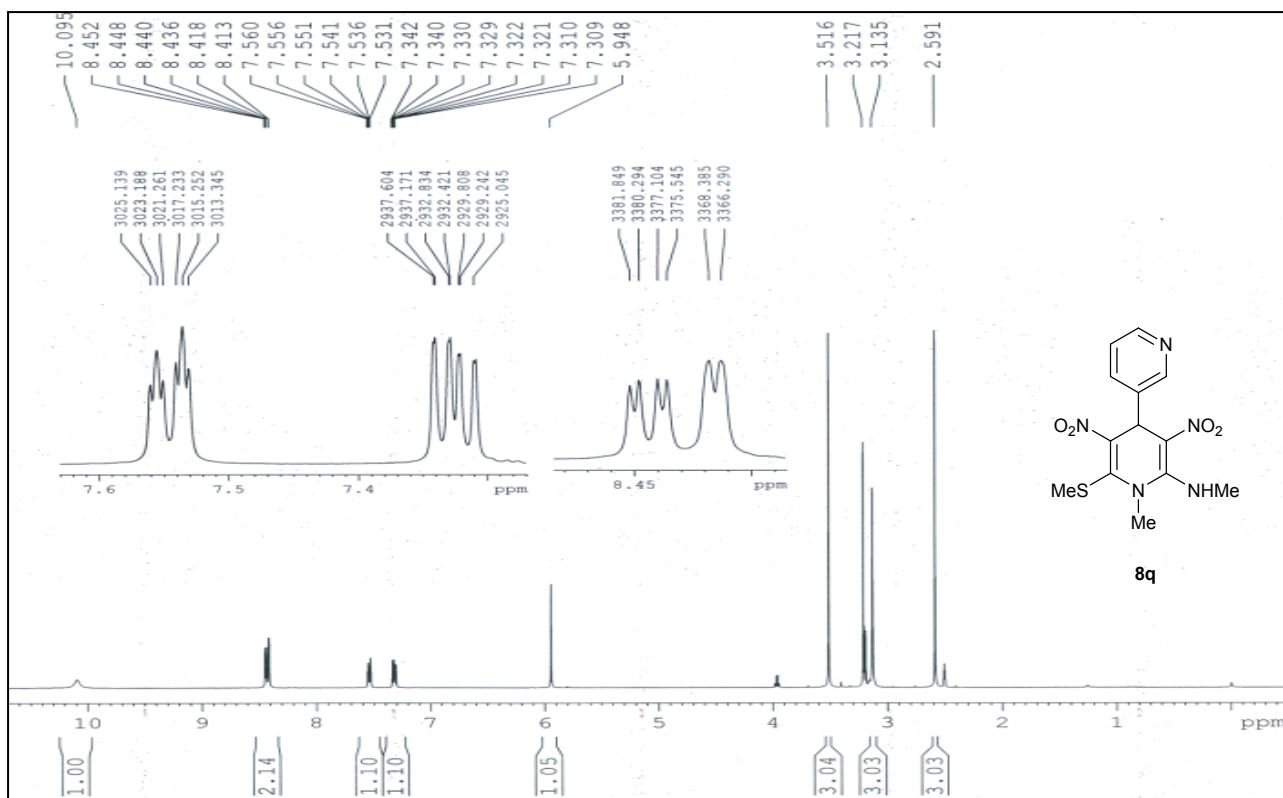
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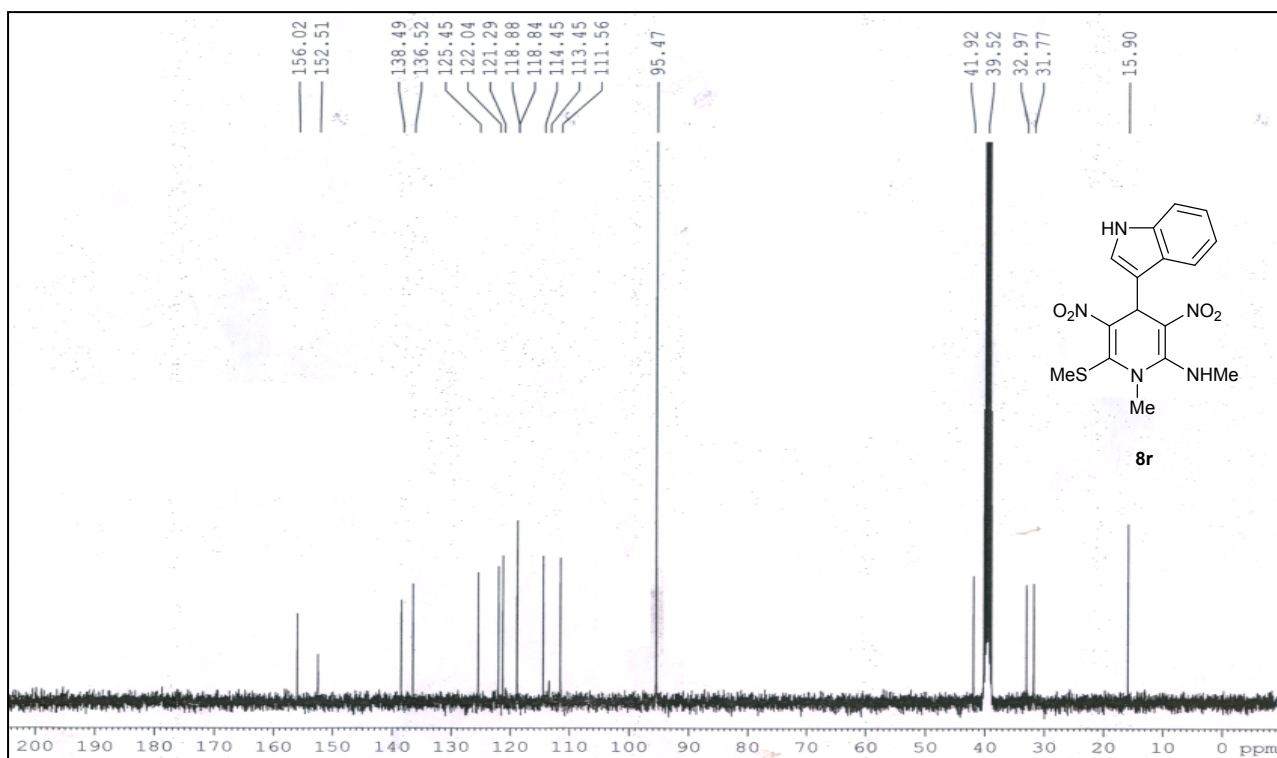
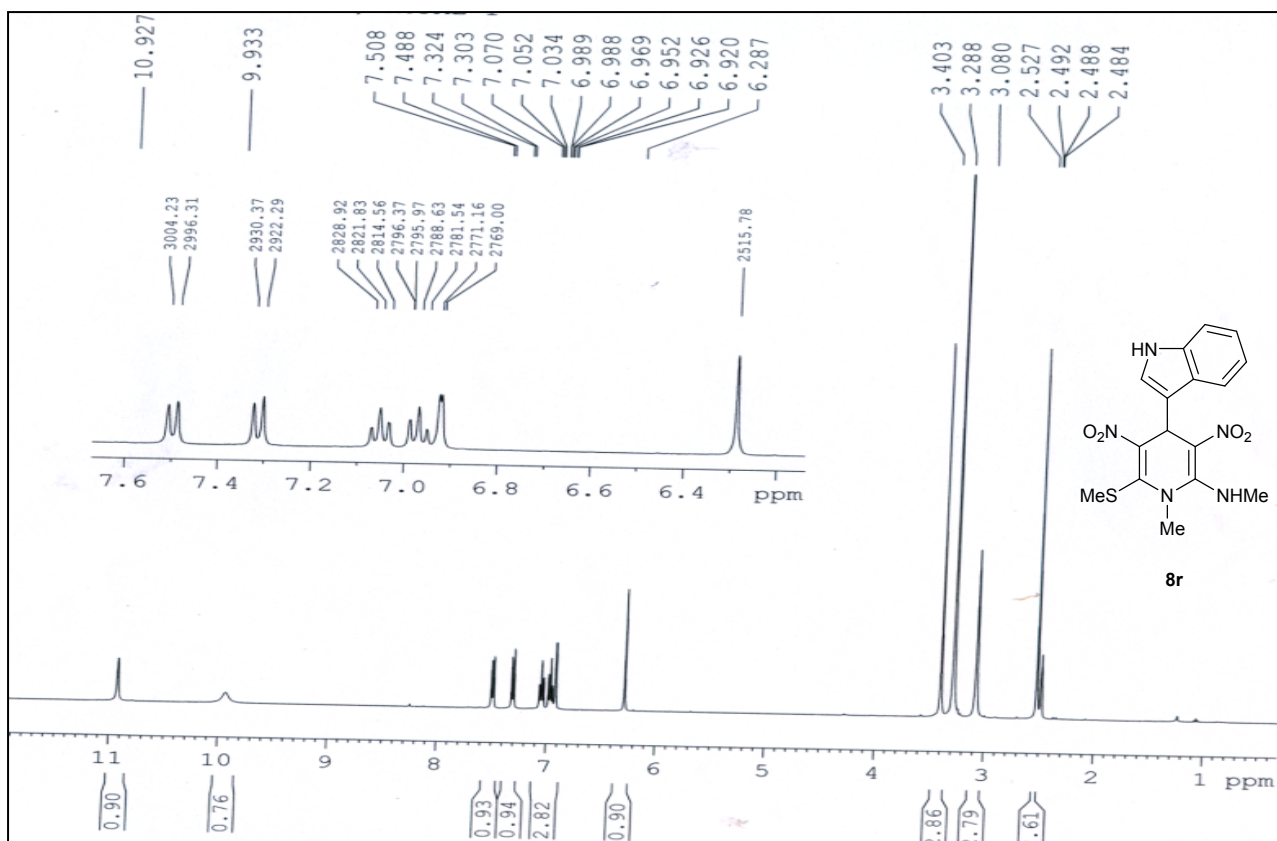
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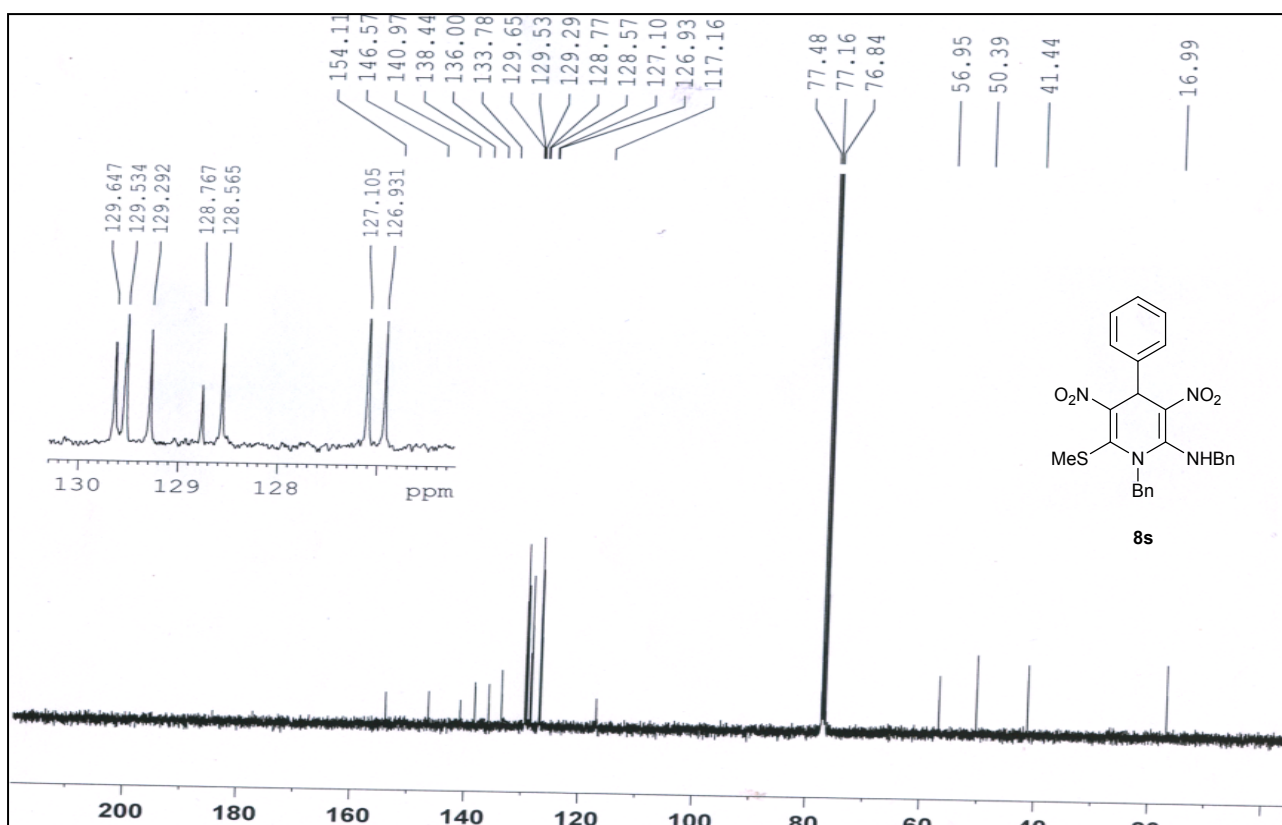
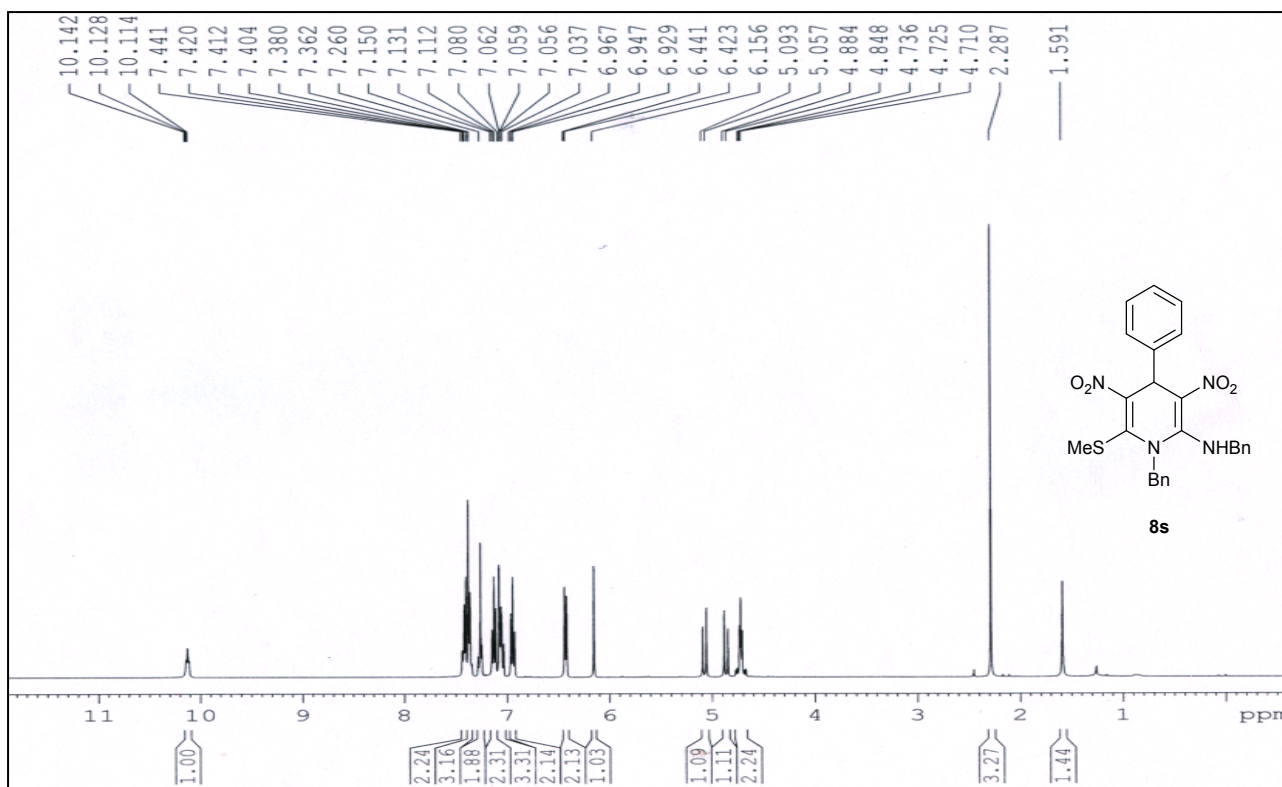
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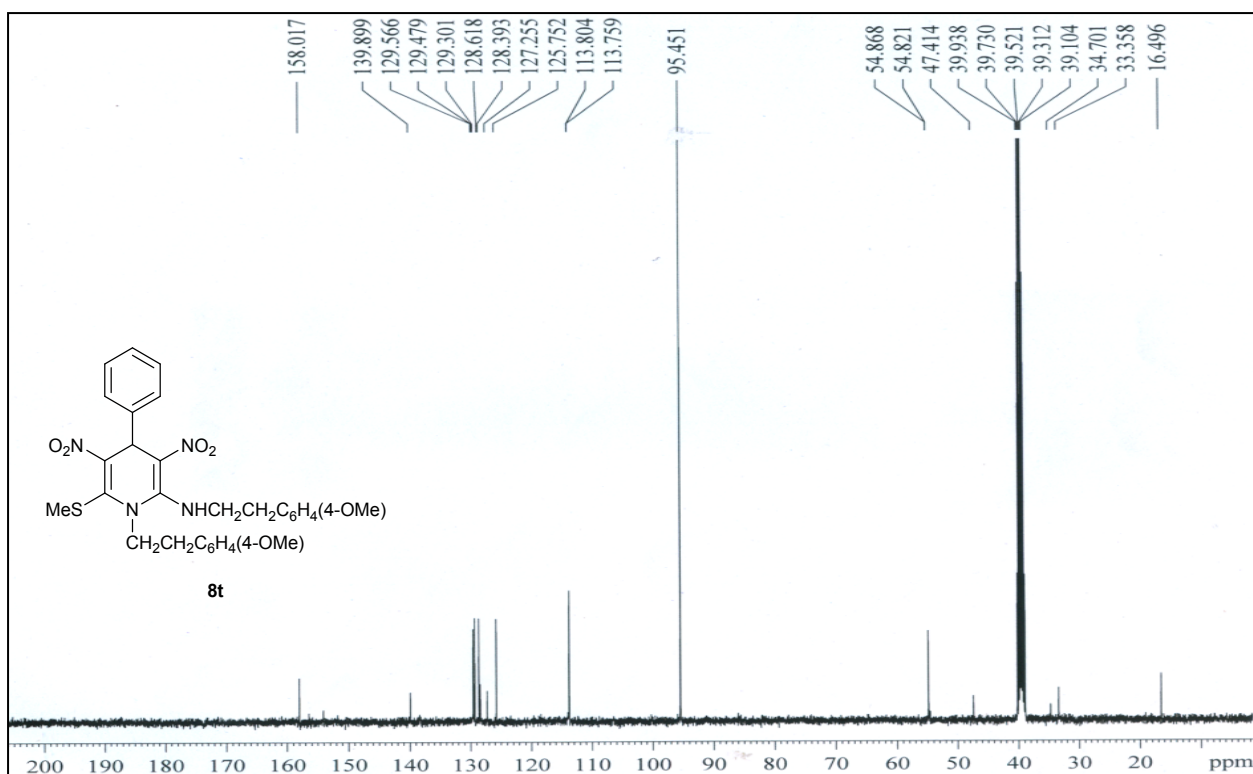
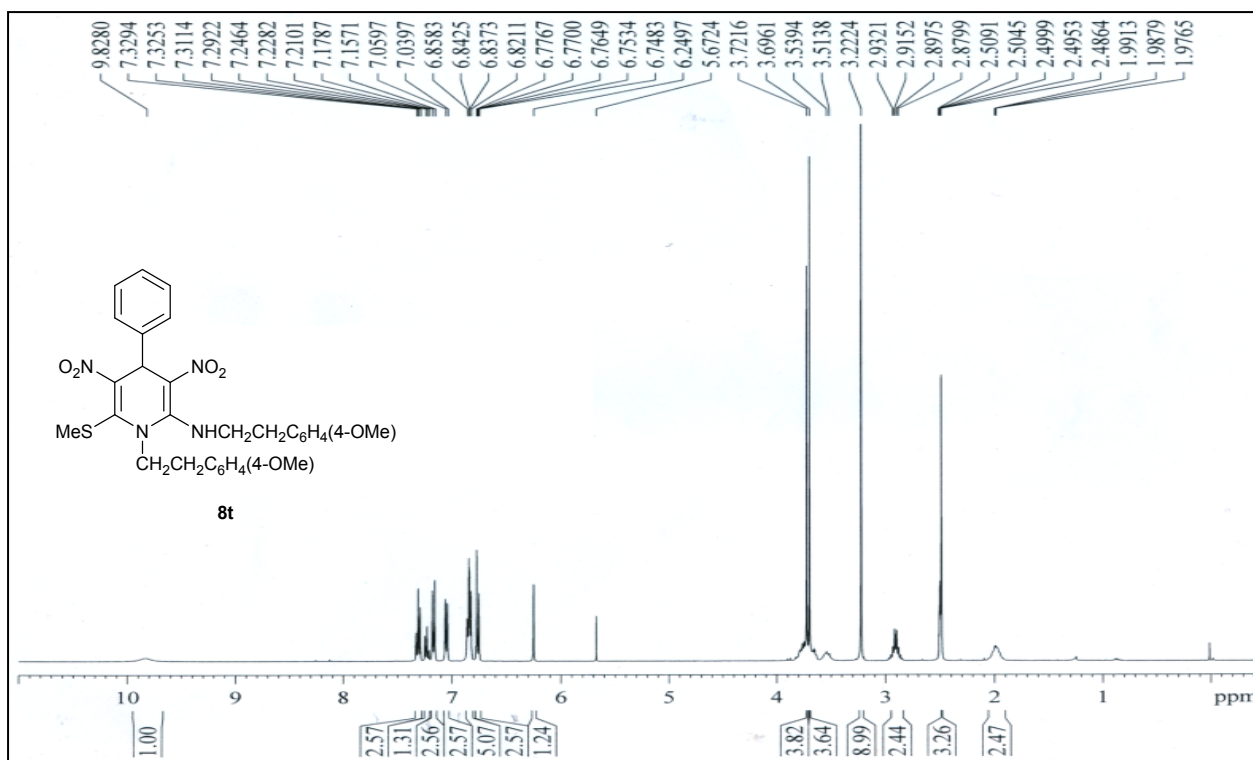
¹H NMR (400 MHz, DMSO-d₆ + CCl₄, 1:1) and ¹³C NMR (100 MHz, DMSO-d₆ + CCl₄, 1:1) spectra of *N*,1'-dimethyl-6'-(methylthio)-3',5'-dinitro-1',4'-dihydro-[3,4'-bipyridin]-2'-amine **8q**.



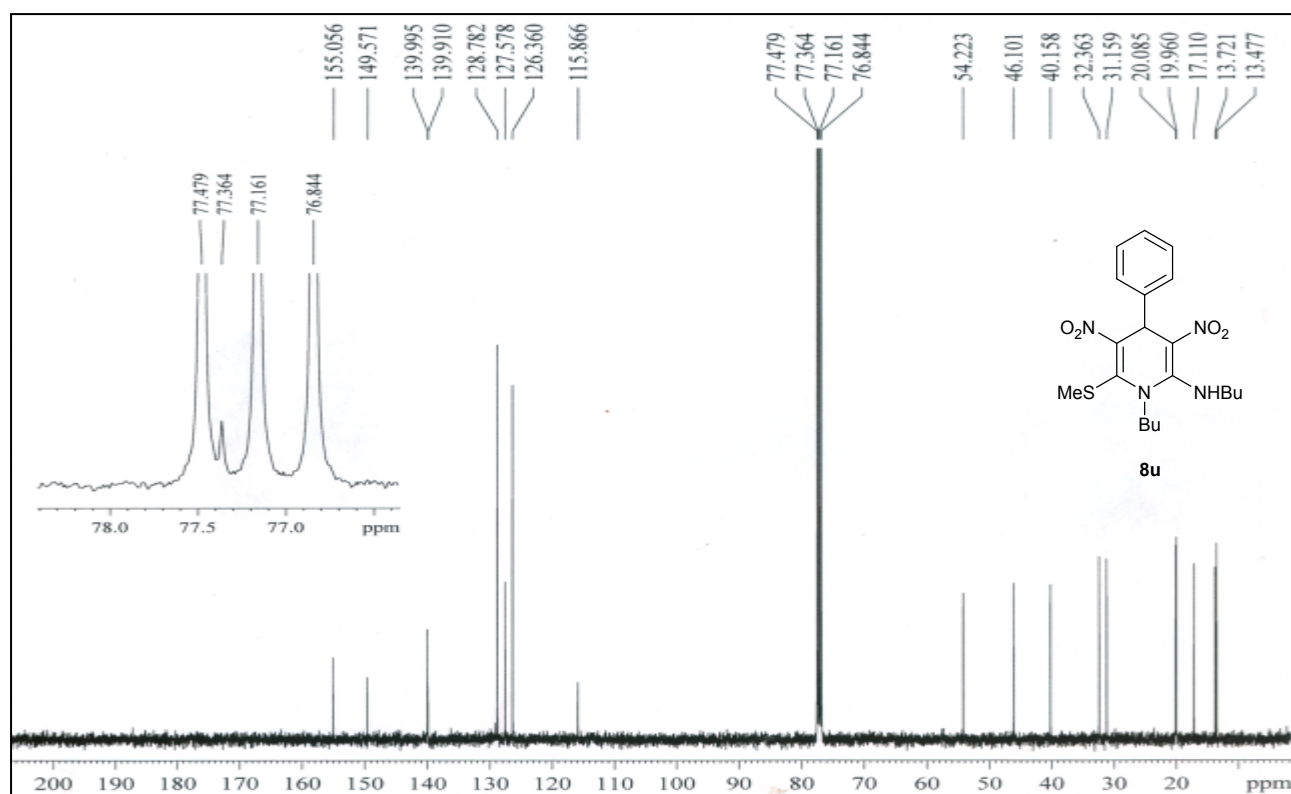
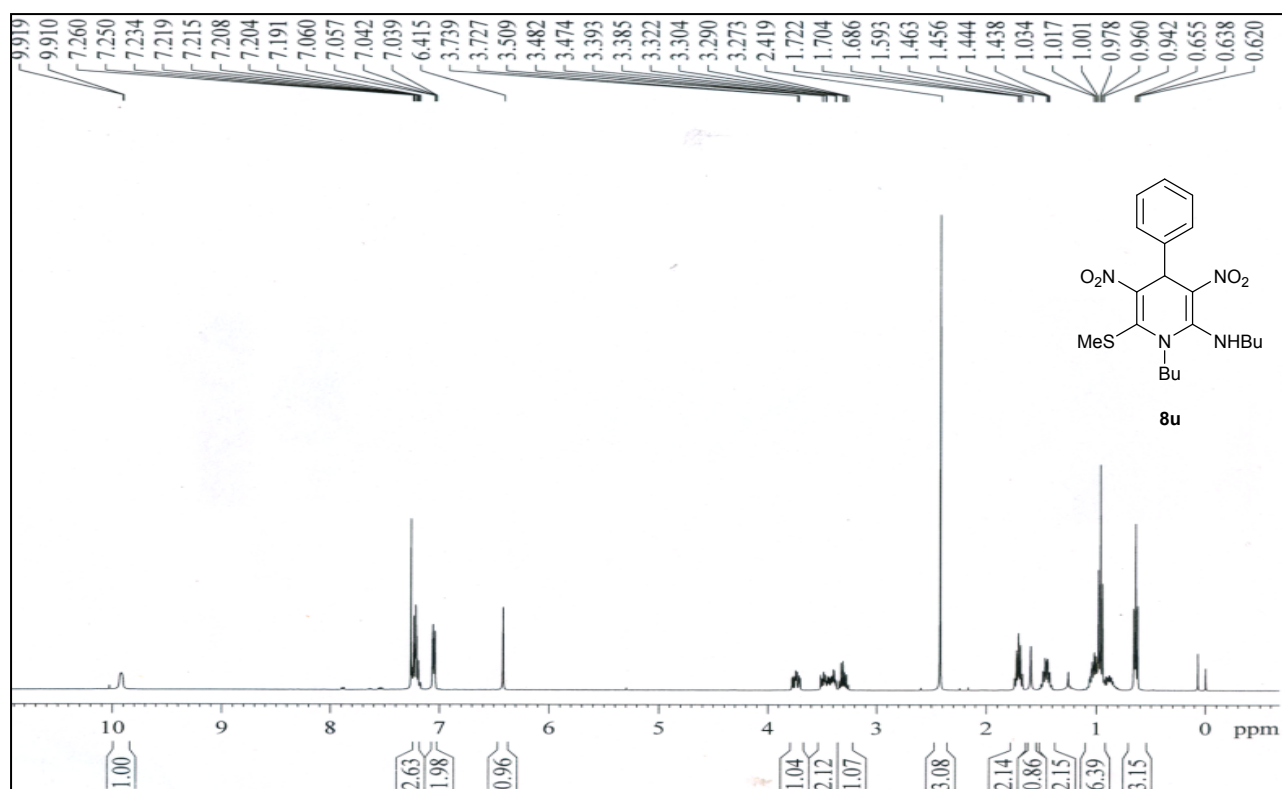
¹H NMR (400 MHz, DMSO-d₆ + CCl₄, 1:1) and ¹³C NMR (100 MHz, DMSO-d₆ + CCl₄, 1:1) spectra of 4-(1*H*-indol-3-yl)-*N*,1-dimethyl-6-(methylthio)-3,5-dinitro-1,4-dihydropyridin-2-amine **8r**.



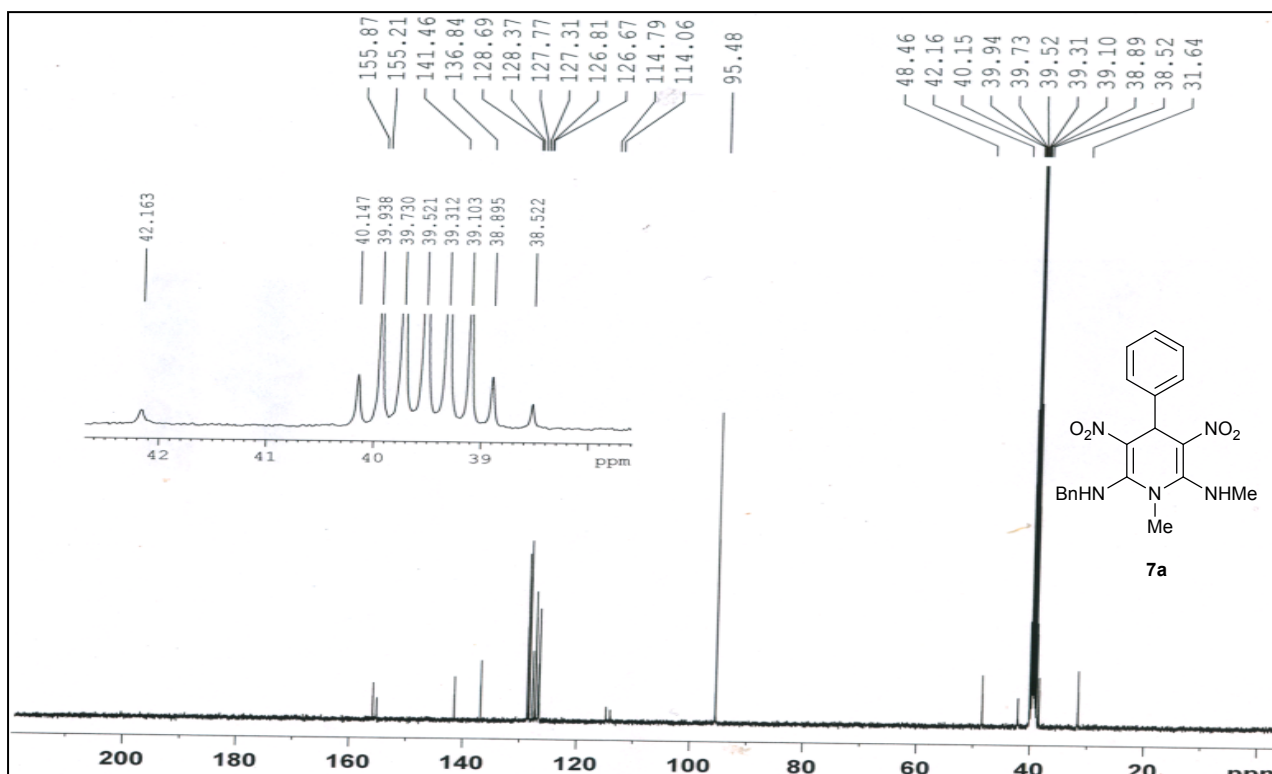
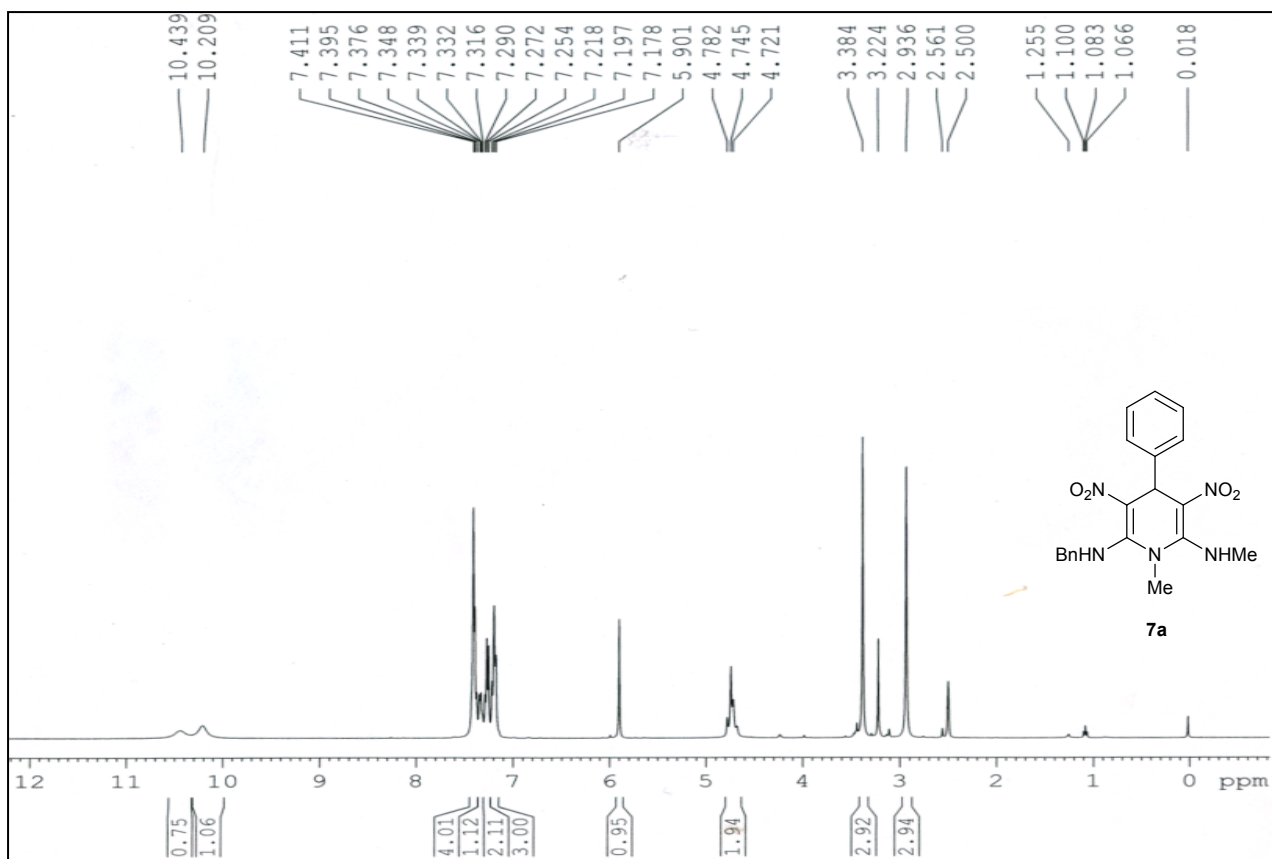
¹H NMR (400 MHz, CDCl₃) and ¹³C NMR (100 MHz, CDCl₃) spectra of *N*,1-dibenzyl-6-(methylthio)-3,5-dinitro-4-phenyl-1,4-dihydropyridin-2-amine **8s**.



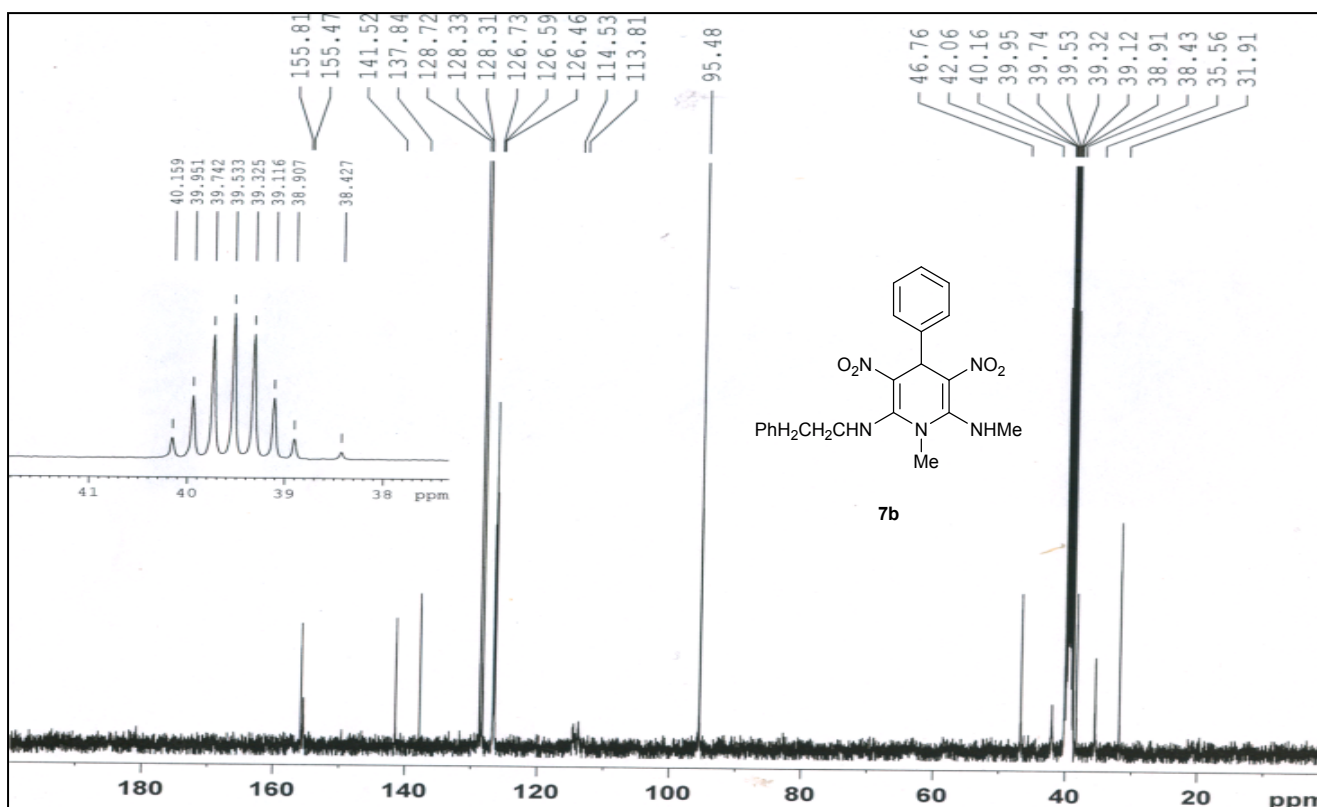
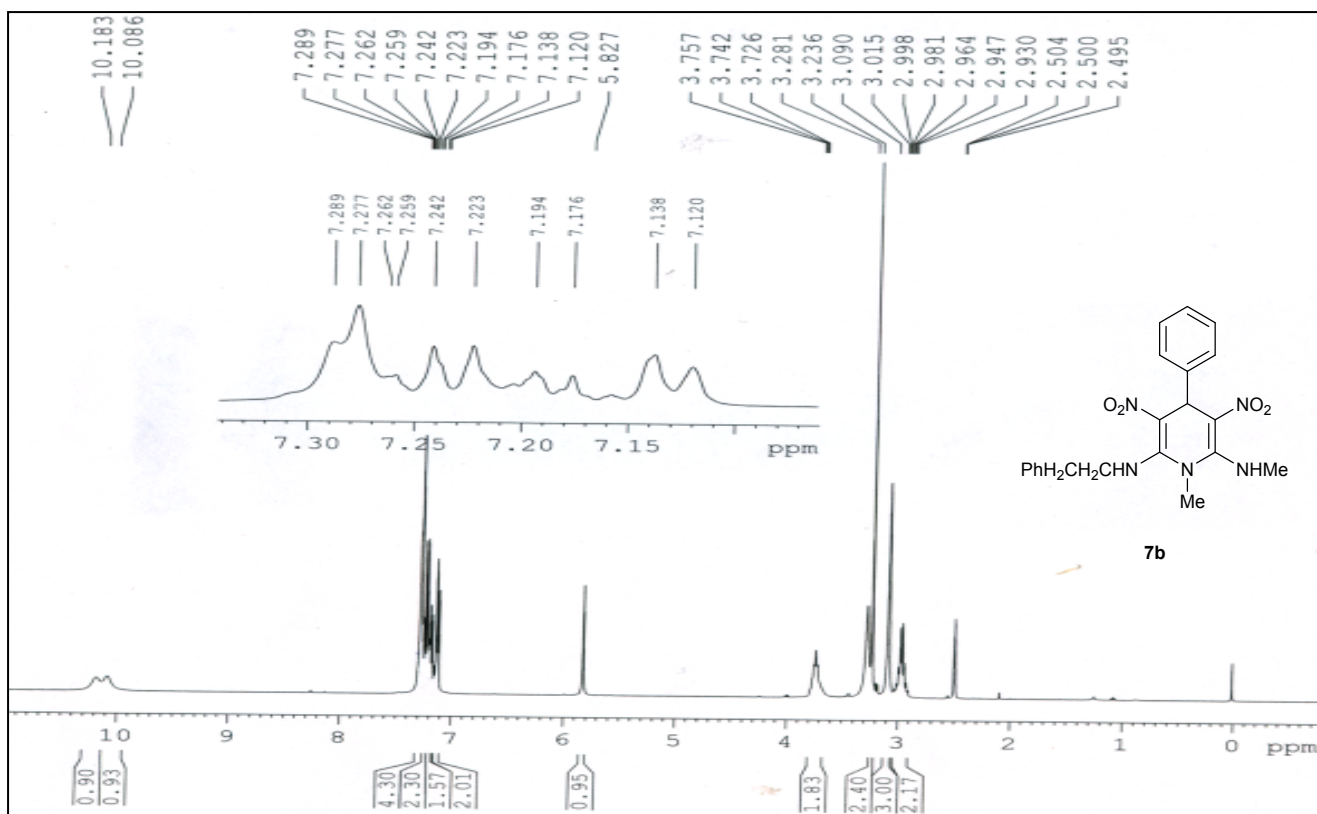
¹H NMR (400 MHz, CDCl₃ + CCl₄, 1:1) and ¹³C NMR (100 MHz, CDCl₃ + CCl₄, 1:1) spectra of *N*,1-bis(4-methoxyphenethyl)-6-(methylthio)-3,5-dinitro-4-phenyl-1,4-dihydropyridin-2-amine **8t**.



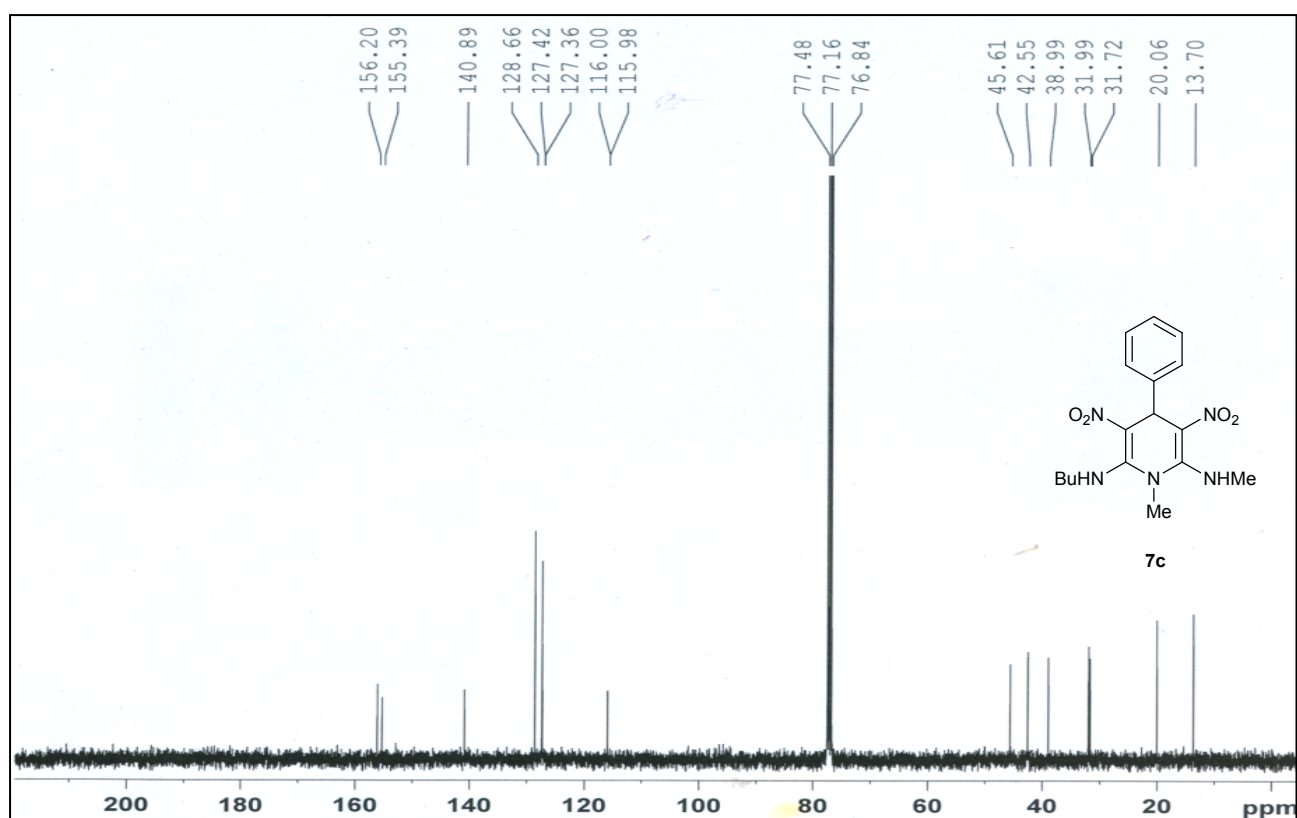
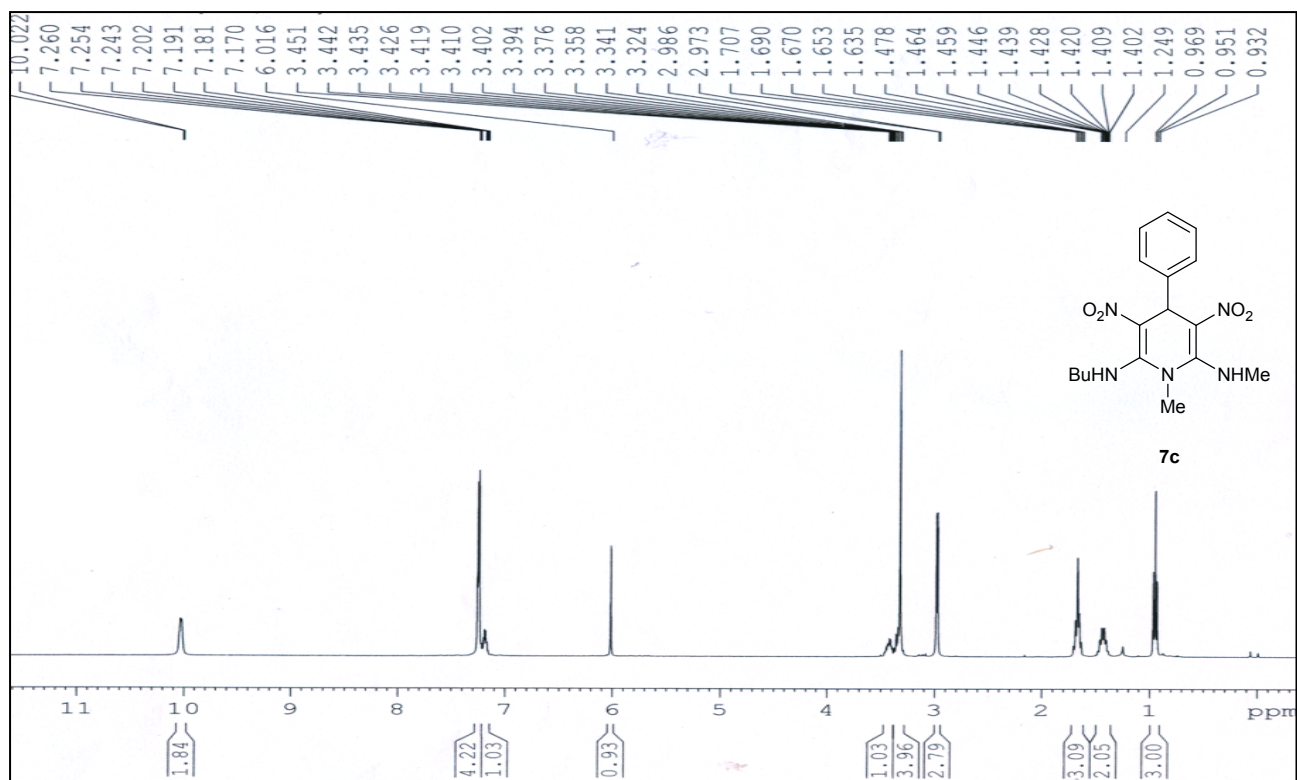
¹H NMR (400 MHz, CDCl₃) and ¹³C NMR (100 MHz, CDCl₃) spectra of *N*,1-dibutyl-6-(methylthio)-3,5-dinitro-4-phenyl-1,4-dihydropyridin-2-amine **8u**.



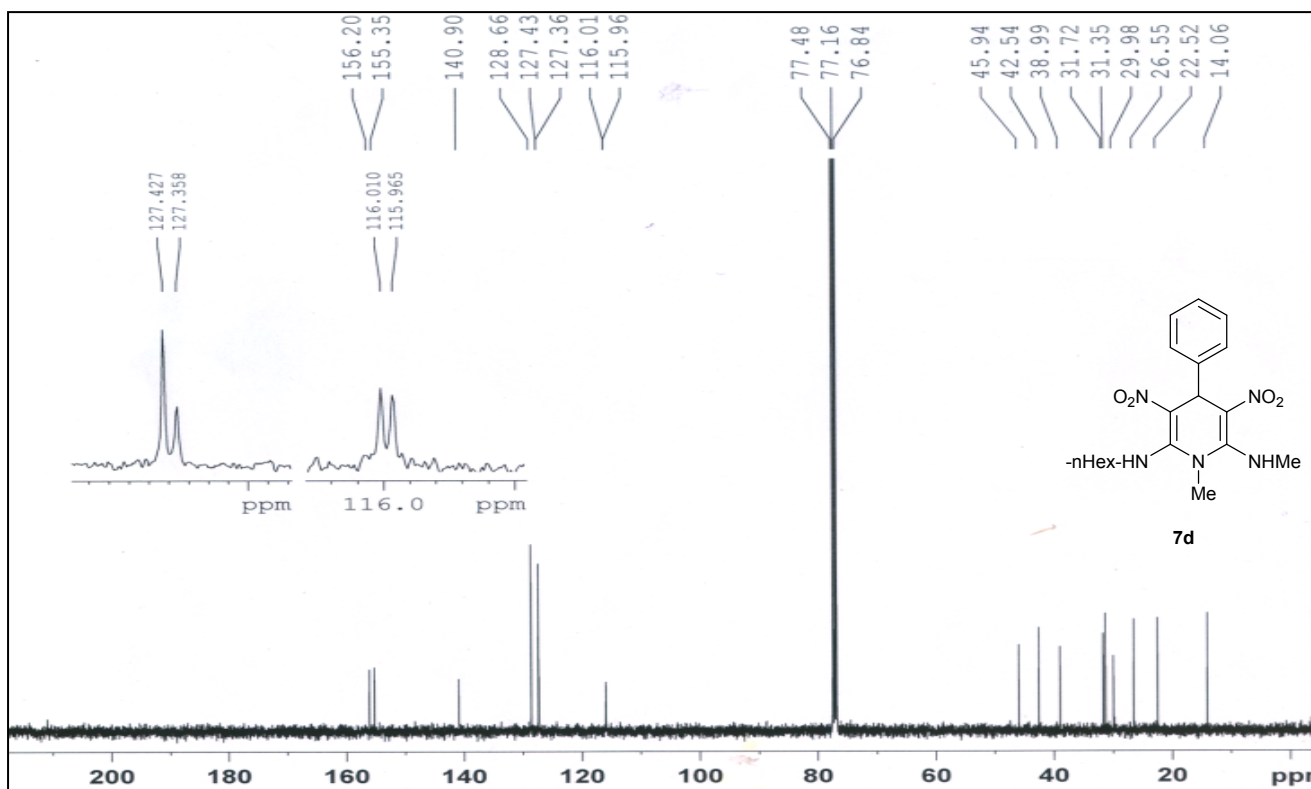
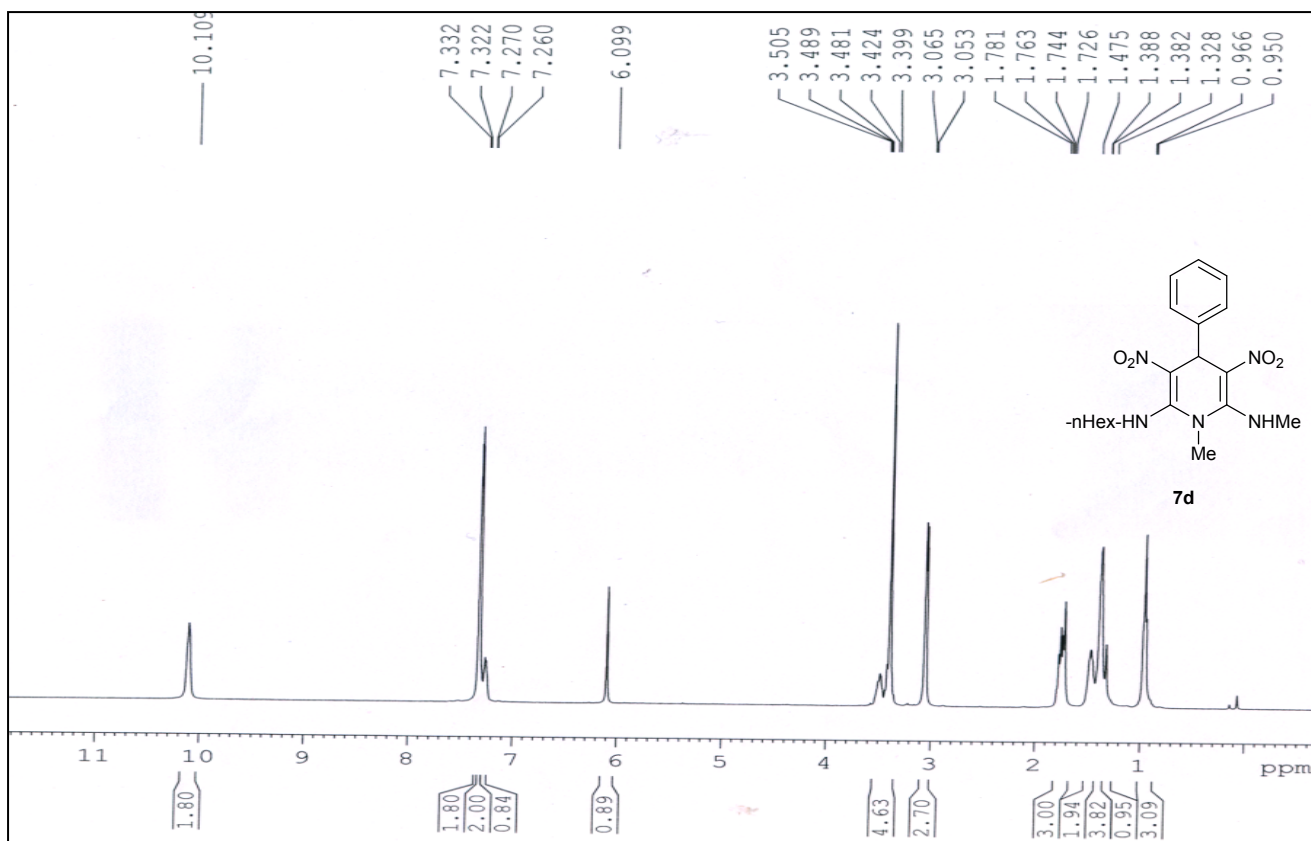
¹H NMR (400 MHz, DMSO-d₆ + CCl₄, 1:1) and ¹³C NMR (100 MHz, DMSO-d₆ + CCl₄, 1:1) spectra of *N*-2-benzyl-*N*-6,1-dimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **7a**.



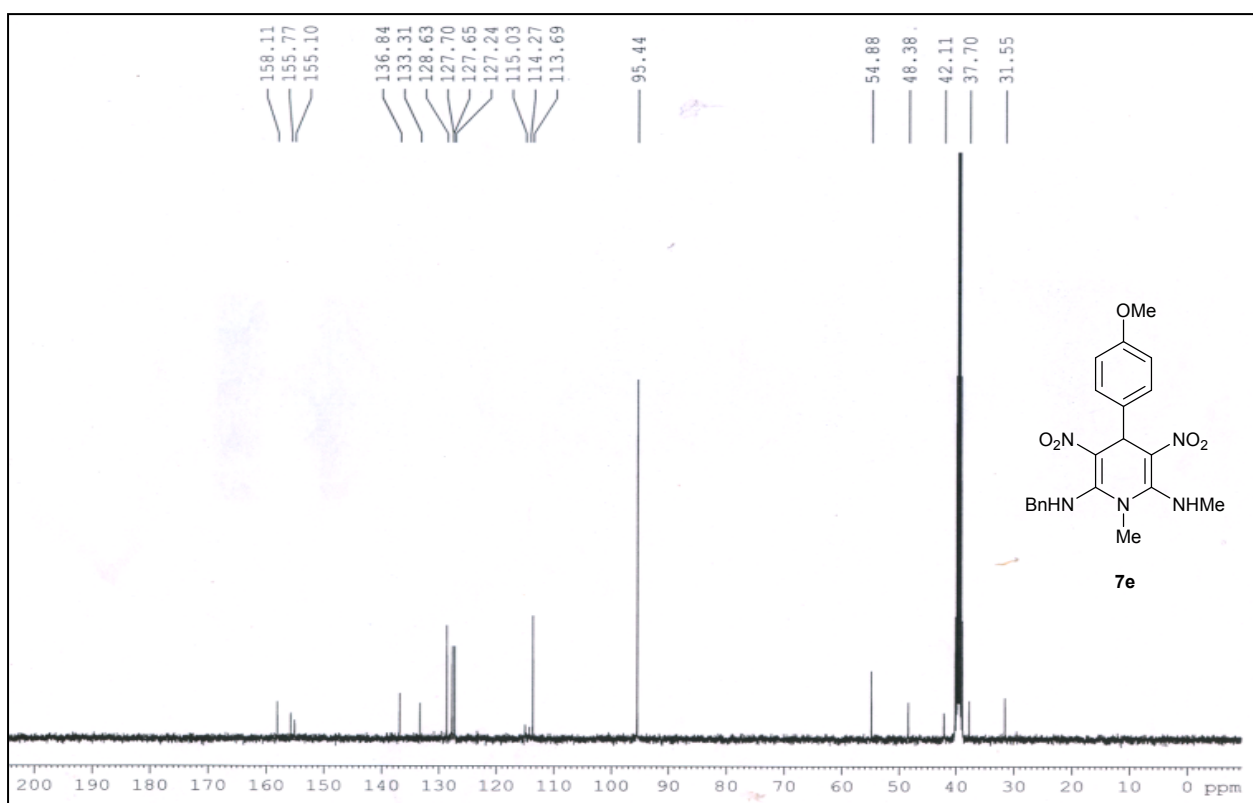
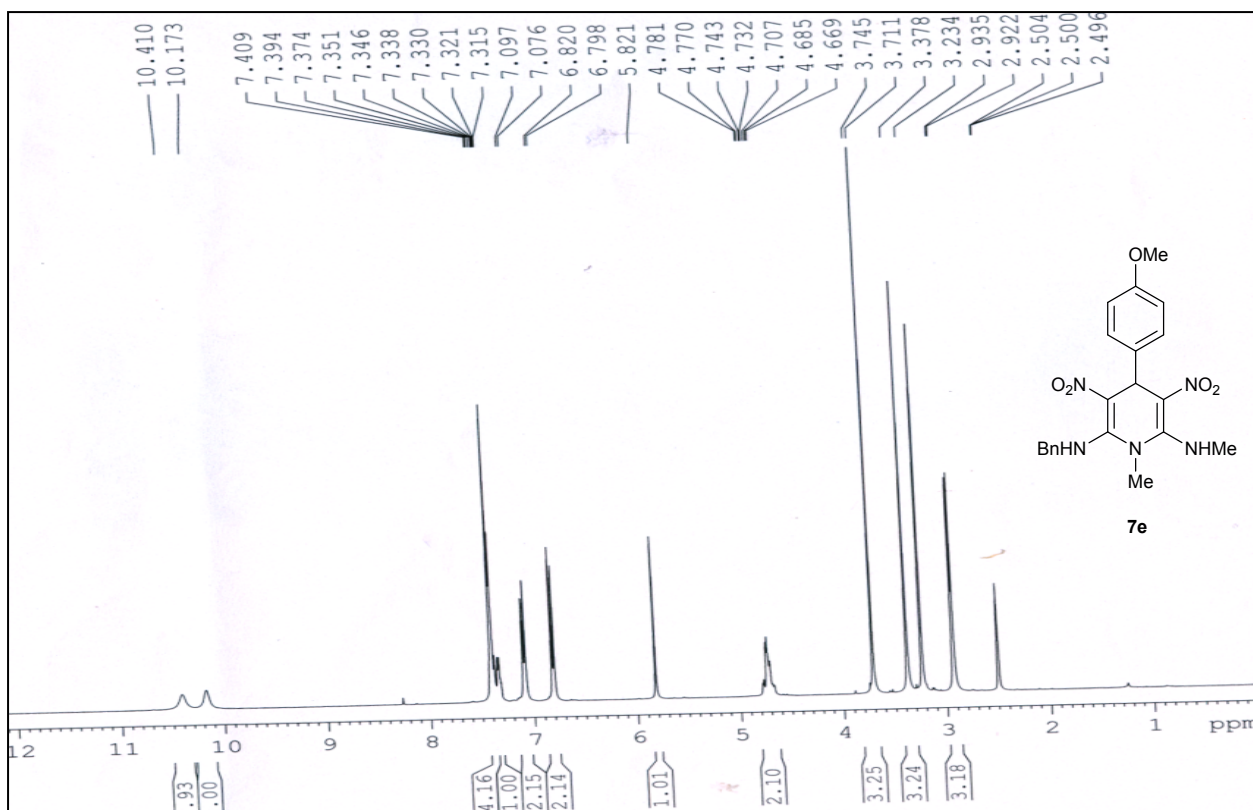
¹H NMR (400 MHz, DMSO-*d*₆ + CCl₄, 1:1) and ¹³C NMR (100 MHz, DMSO-*d*₆ + CCl₄, 1:1) spectra of *N*2,1-dimethyl-3,5-dinitro-*N*6-phenethyl-4-phenyl-1,4-dihydropyridine-2,6-diamine **7b**.



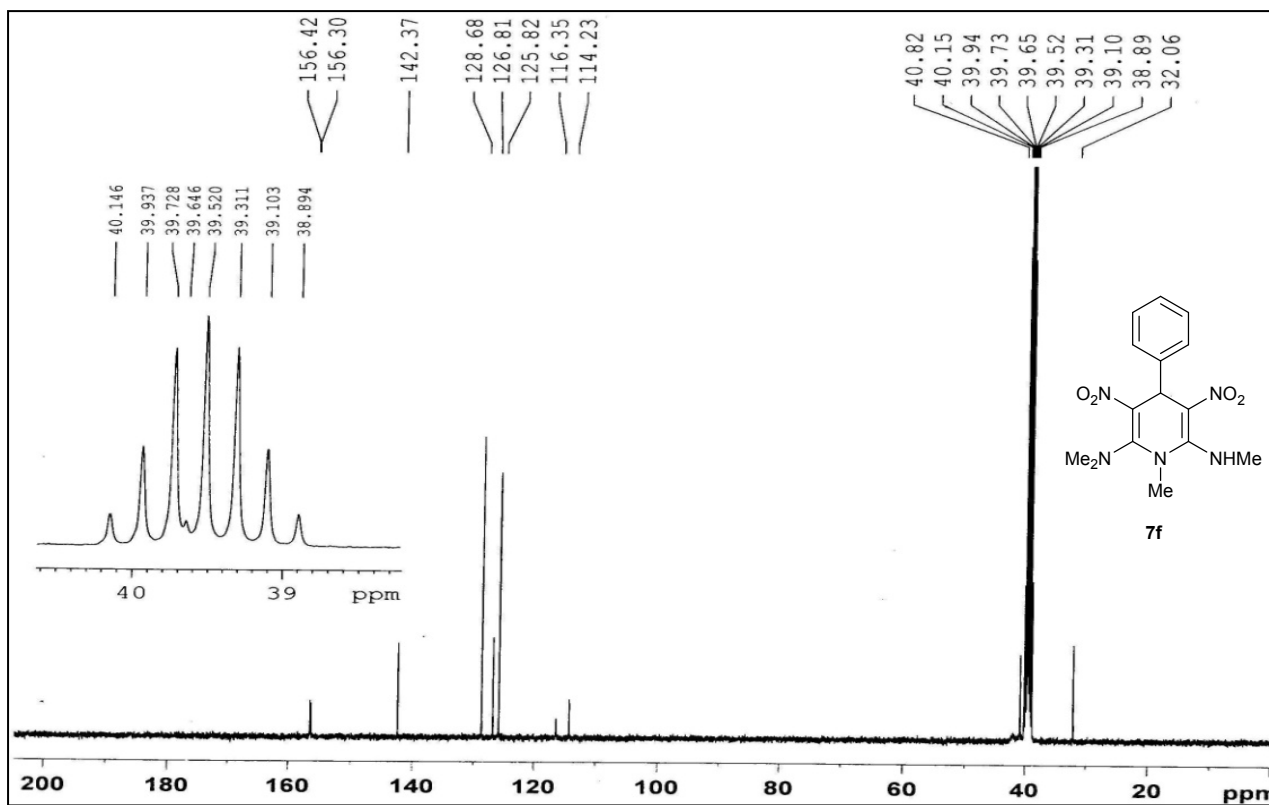
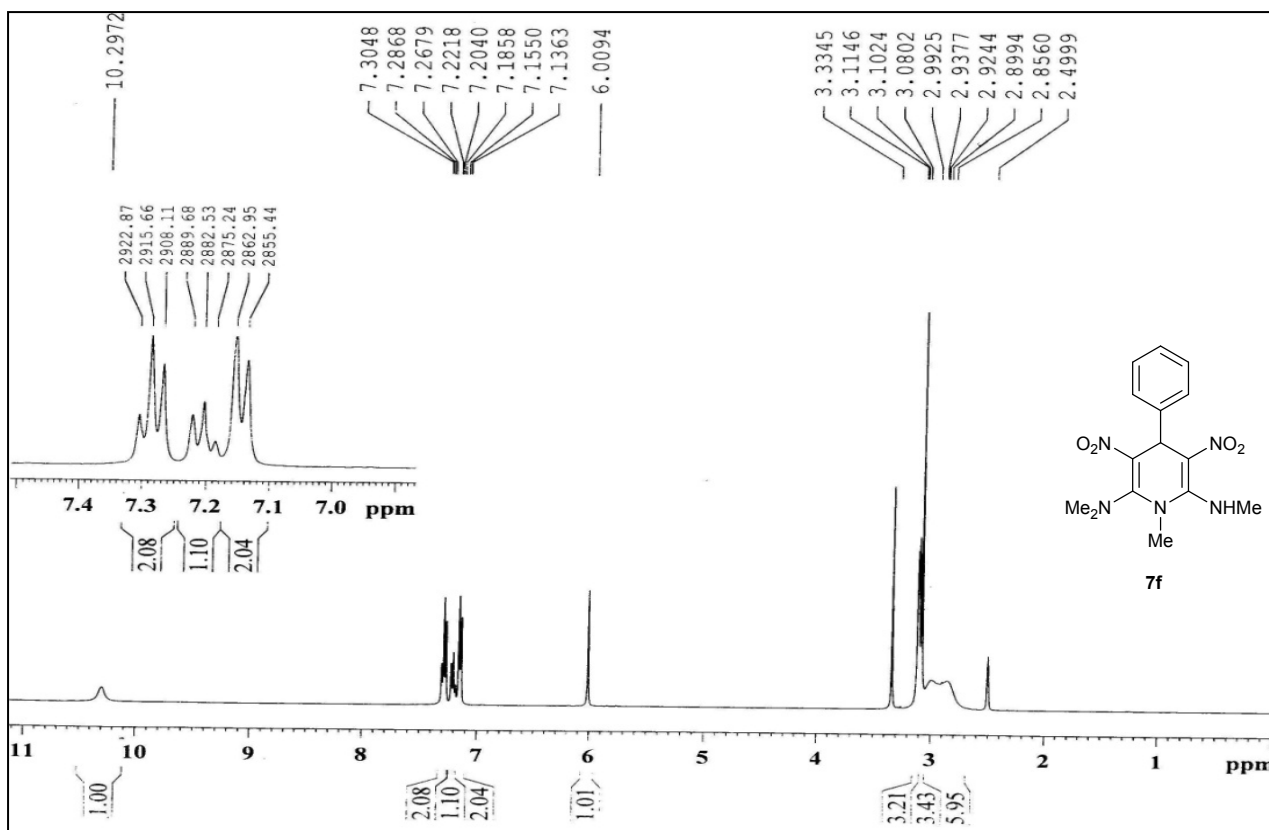
¹H NMR (400 MHz, CDCl₃) and ¹³C NMR (100 MHz, CDCl₃) spectra of *N*2-butyl-*N*6,1-dimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **7c**.



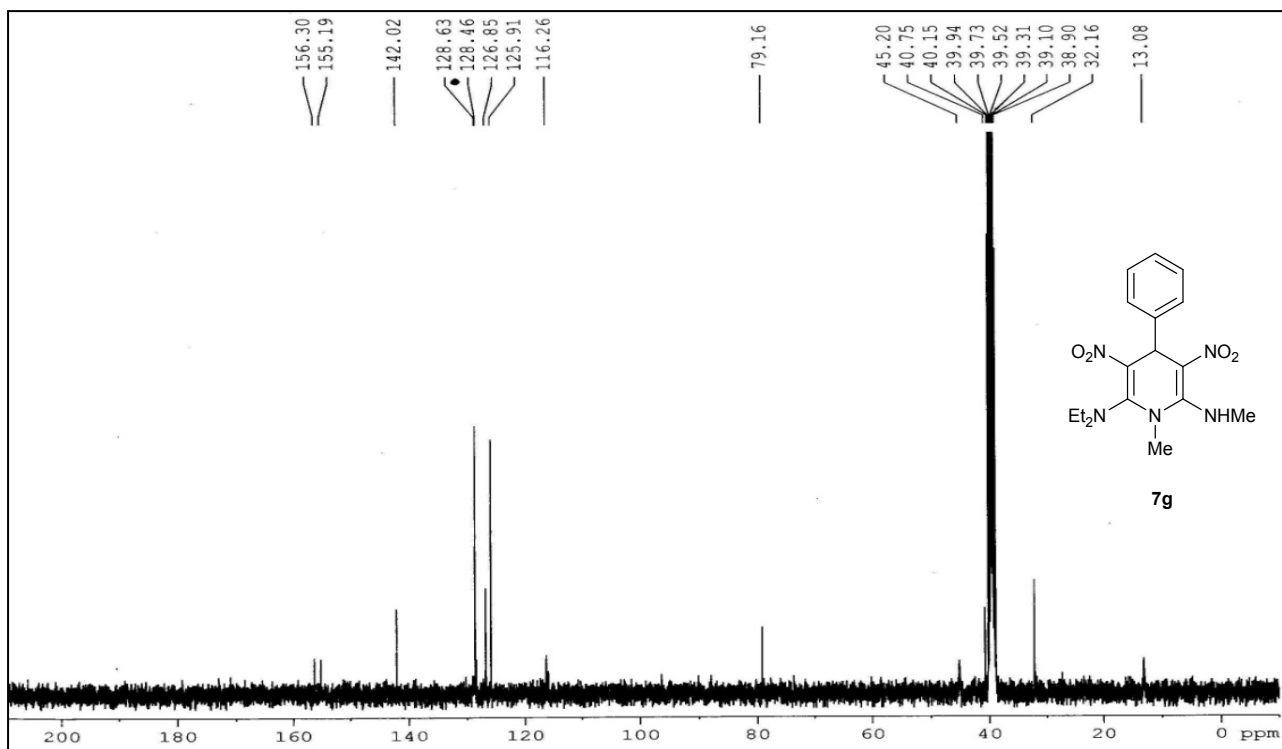
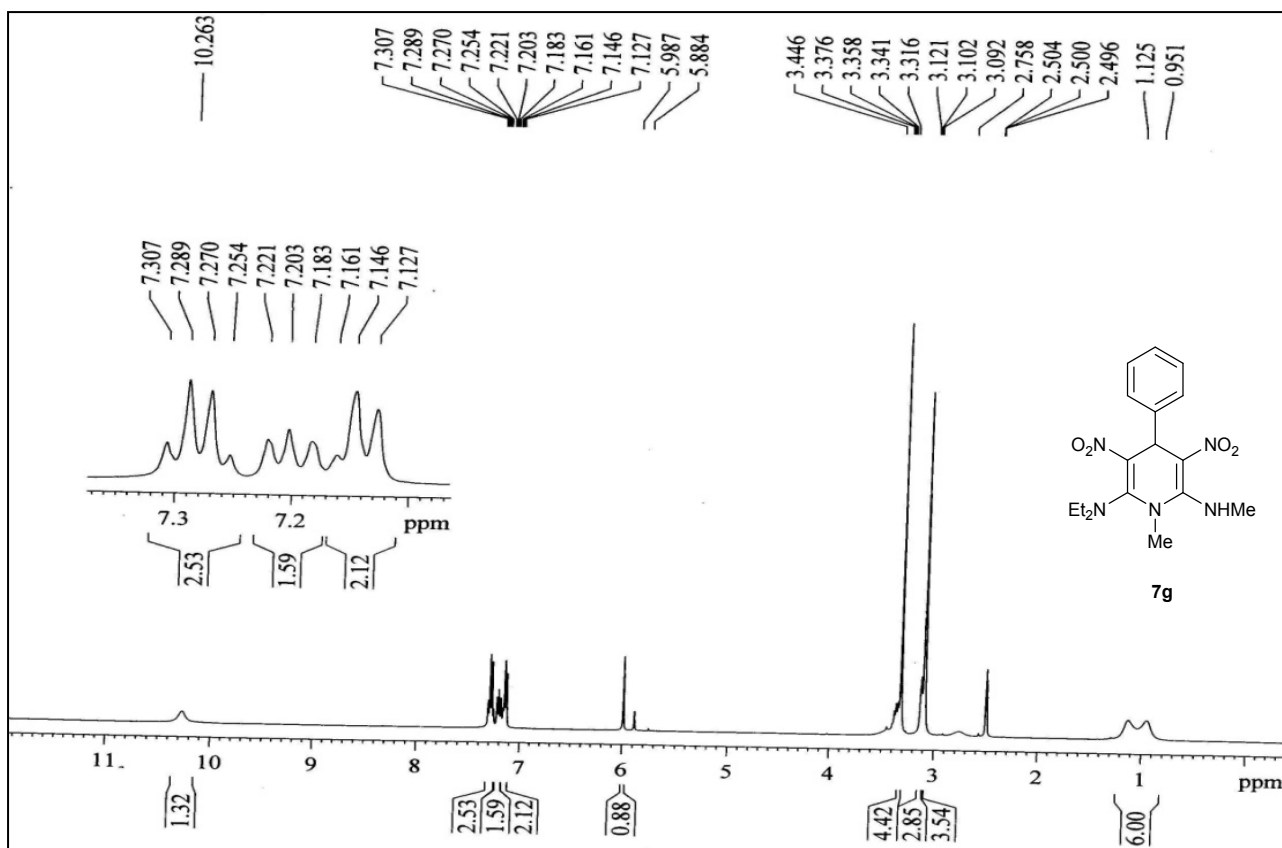
¹H NMR (400 MHz, CDCl₃) and ¹³C NMR (100 MHz, CDCl₃) spectra of N2-hexyl-N6,1-dimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **7d**.



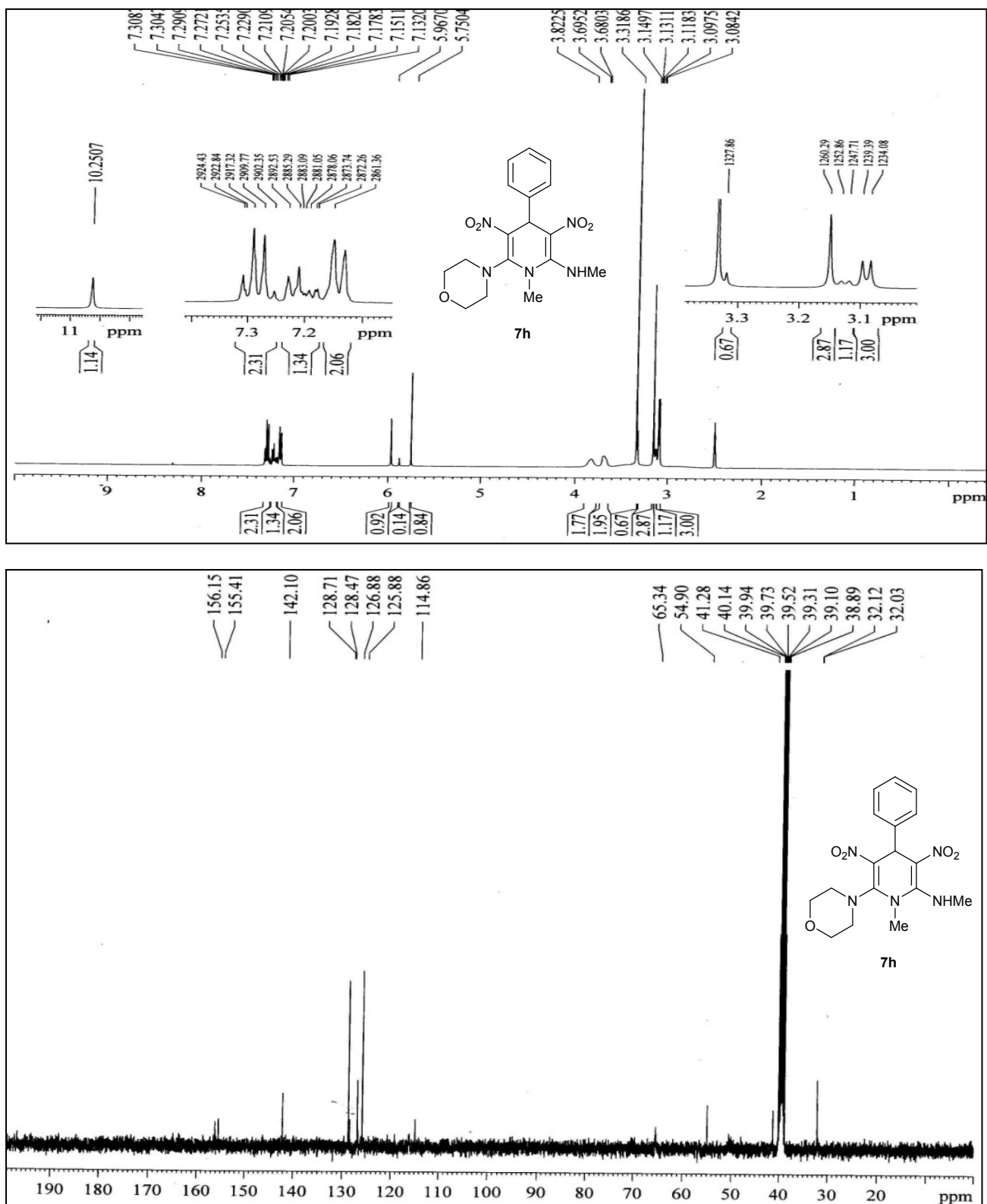
¹H NMR (400 MHz, DMSO-d₆ + CCl₄, 1:1) and ¹³C NMR (100 MHz, DMSO-d₆ + CCl₄, 1:1) spectra of *N*2-benzyl-4-(4-methoxyphenyl)-*N*6,1-dimethyl-3,5-dinitro-1,4-dihydropyridine-2,6-diamine **7e**.



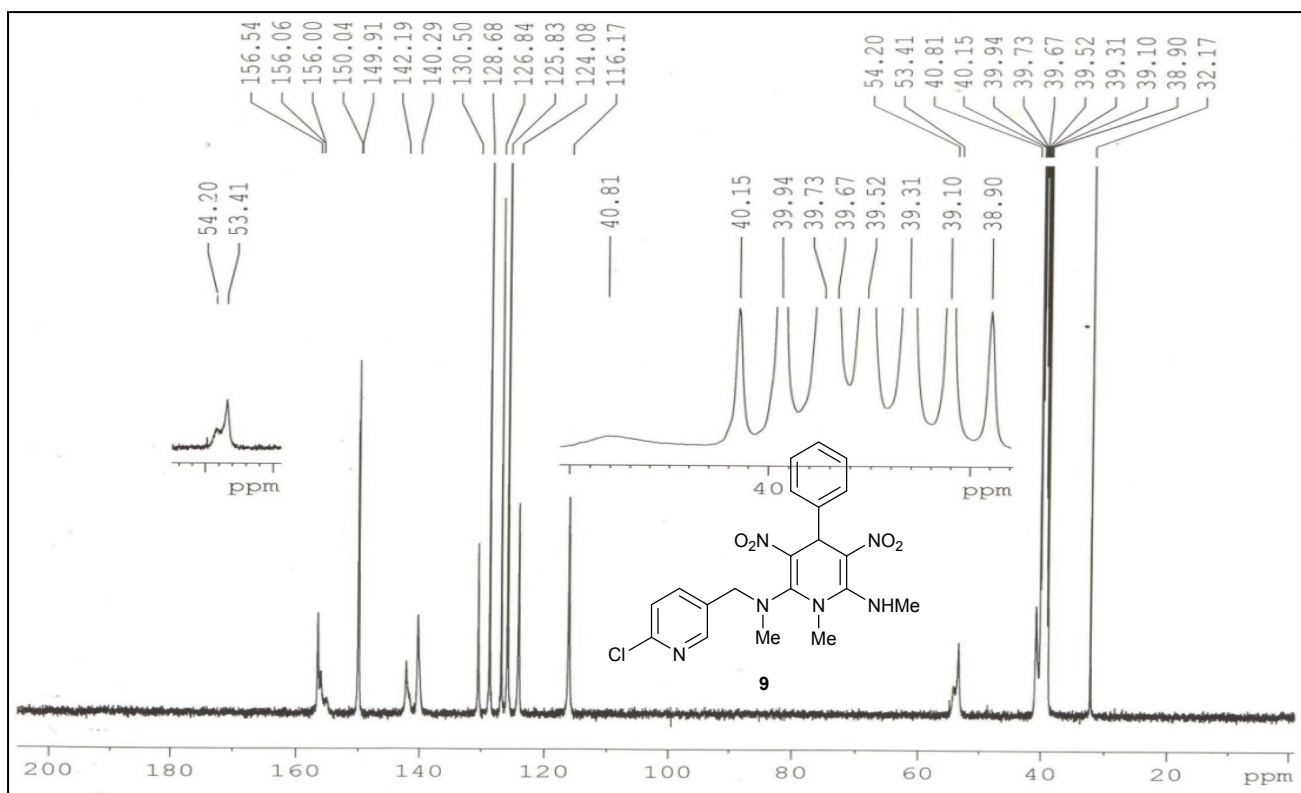
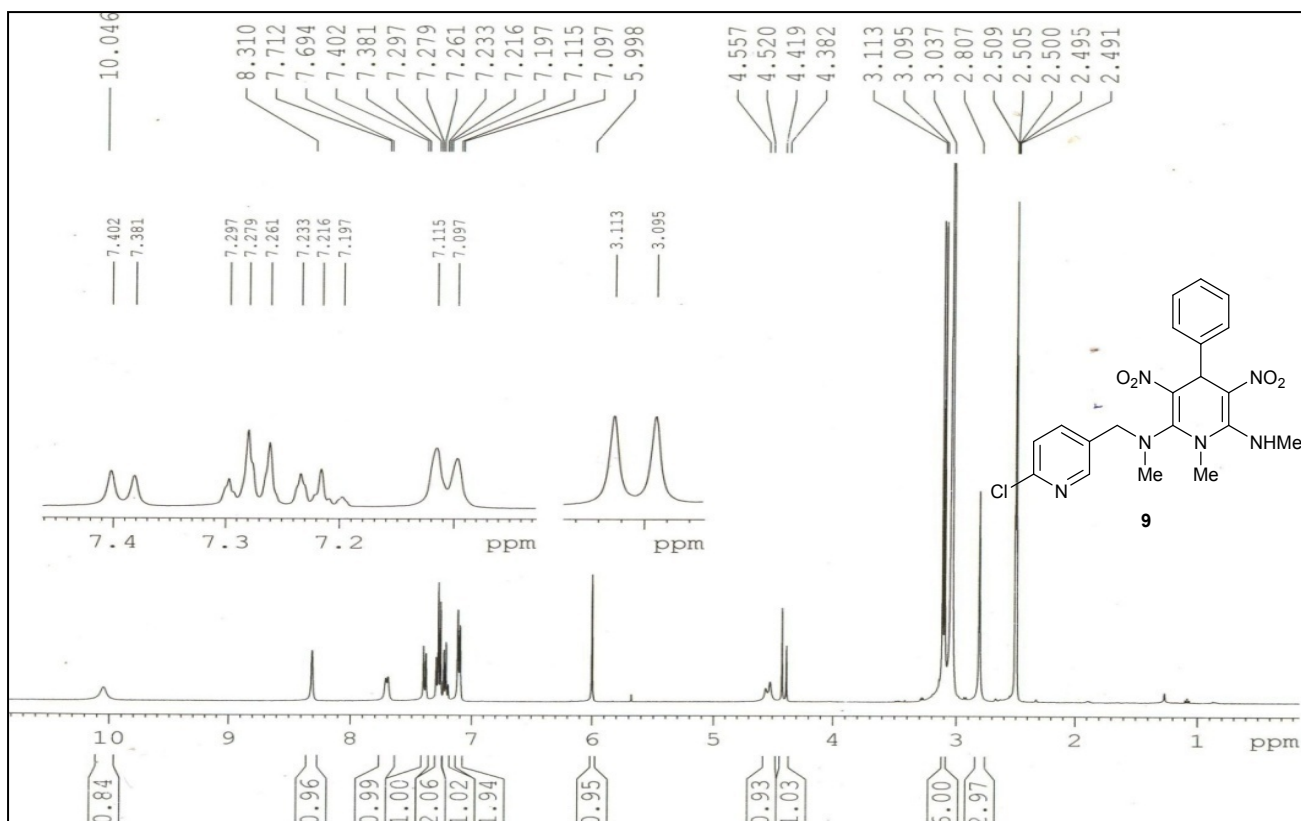
¹H NMR (400 MHz, DMSO-*d*₆) and ¹³C NMR (100 MHz, DMSO-*d*₆) spectra of *N*₂,*N*₂,*N*₆,1-tetramethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **7f**.



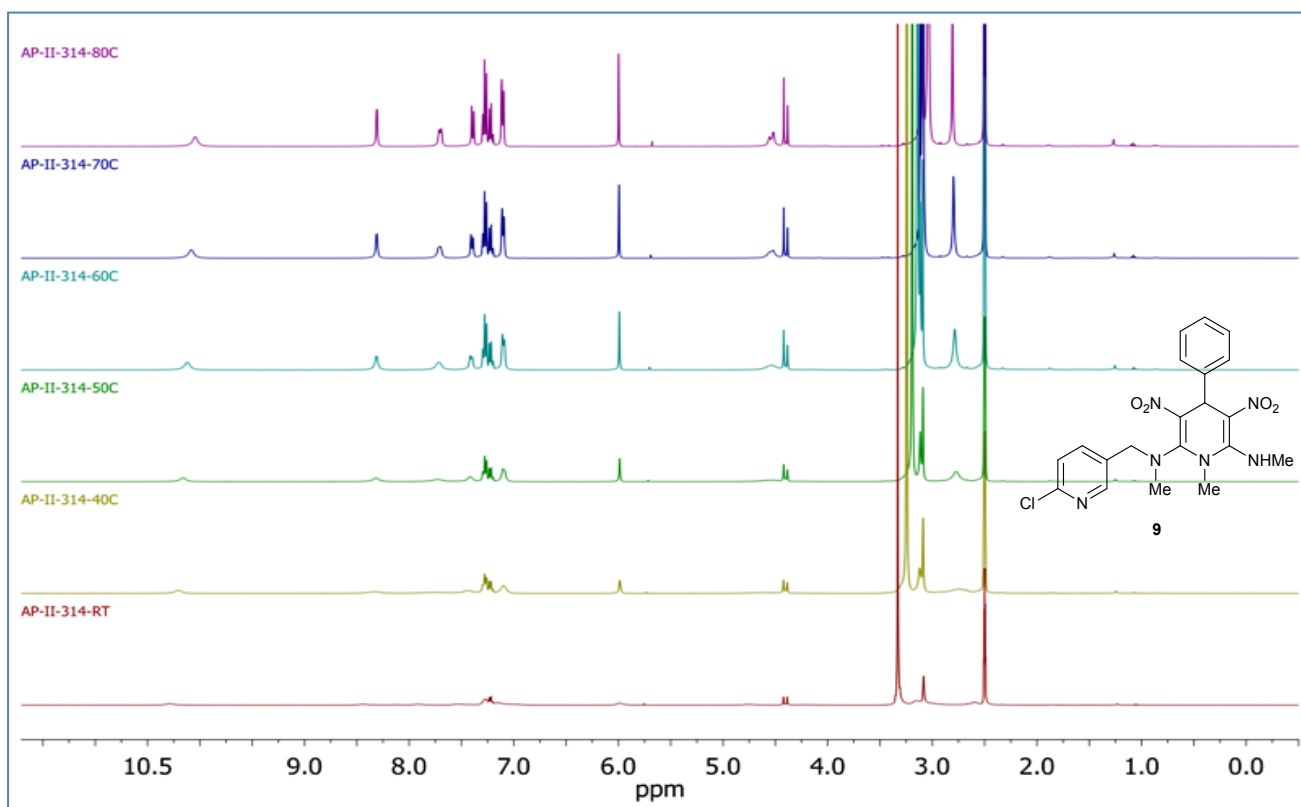
¹H NMR (400 MHz, DMSO-d₆) and ¹³C NMR (100 MHz, DMSO-d₆) spectra of *N*2, *N*2-diethyl-*N*6,1-dimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **7g**.



¹H NMR (400 MHz, DMSO-*d*₆) and ¹³C NMR (100 MHz, DMSO-*d*₆) spectra of *N*, 1-dimethyl-6-morpholino-3,5-dinitro-4-phenyl-1,4-dihydropyridin-2-amine **7h**.



¹H NMR (400 MHz, DMSO-*d*₆) at 80 °C and ¹³C NMR (100 MHz, DMSO-*d*₆) spectra of *N*2-((6-chloropyridin-3-yl)methyl)-*N*2,*N*6,1-trimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **9**.



Variable temperature ^1H NMR (400 MHz, DMSO-d_6) studies on *N*2-((6-chloropyridin-3-yl)methyl)-*N*2,*N*6,1-trimethyl-3,5-dinitro-4-phenyl-1,4-dihydropyridine-2,6-diamine **9**.