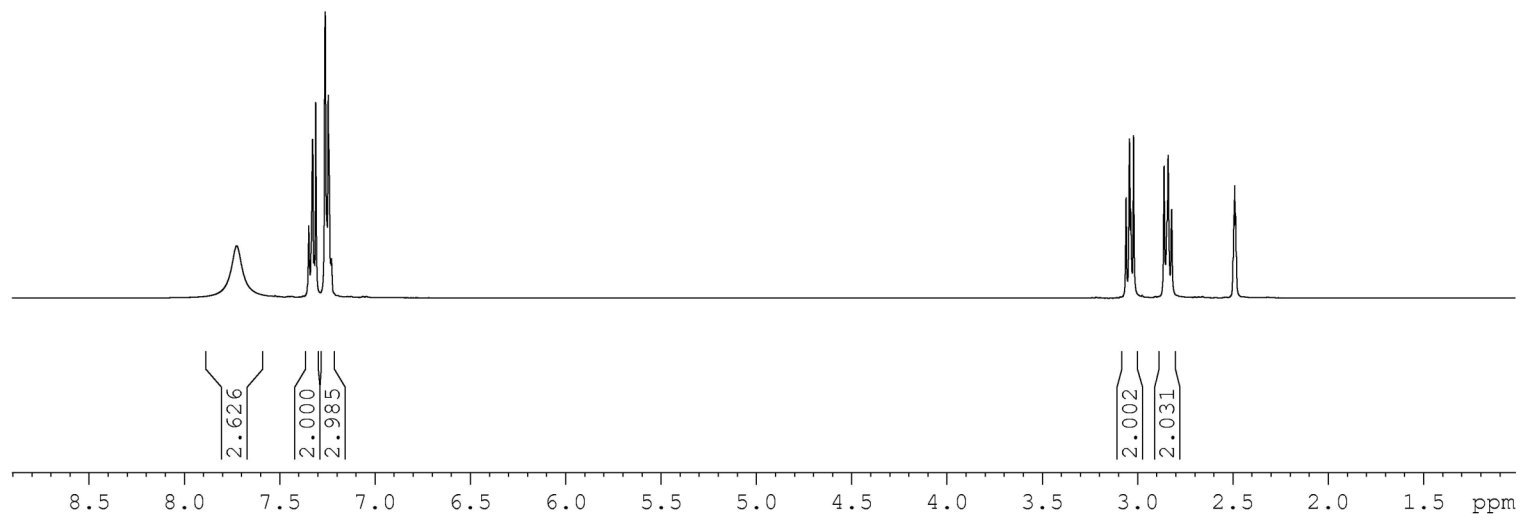
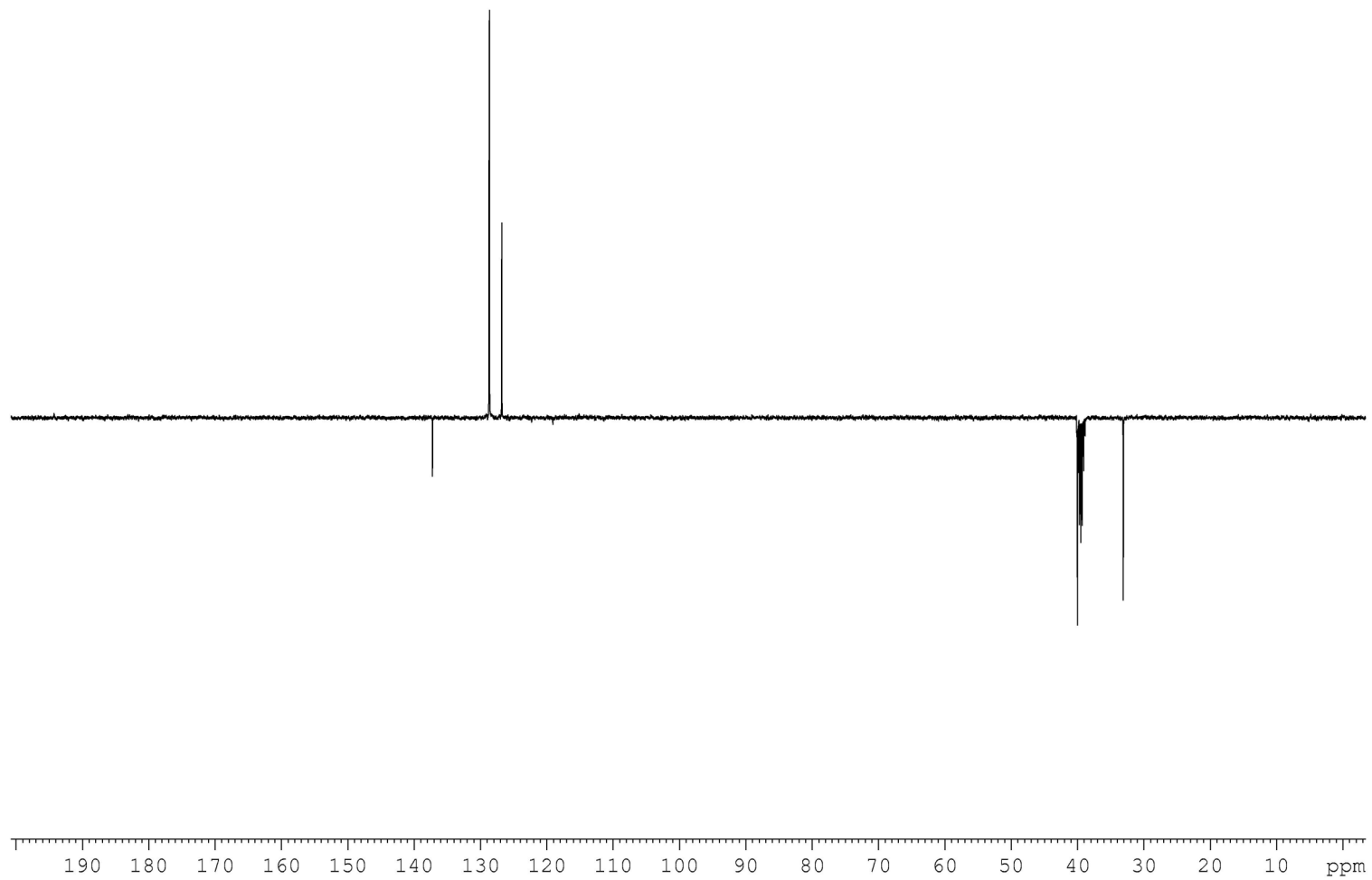


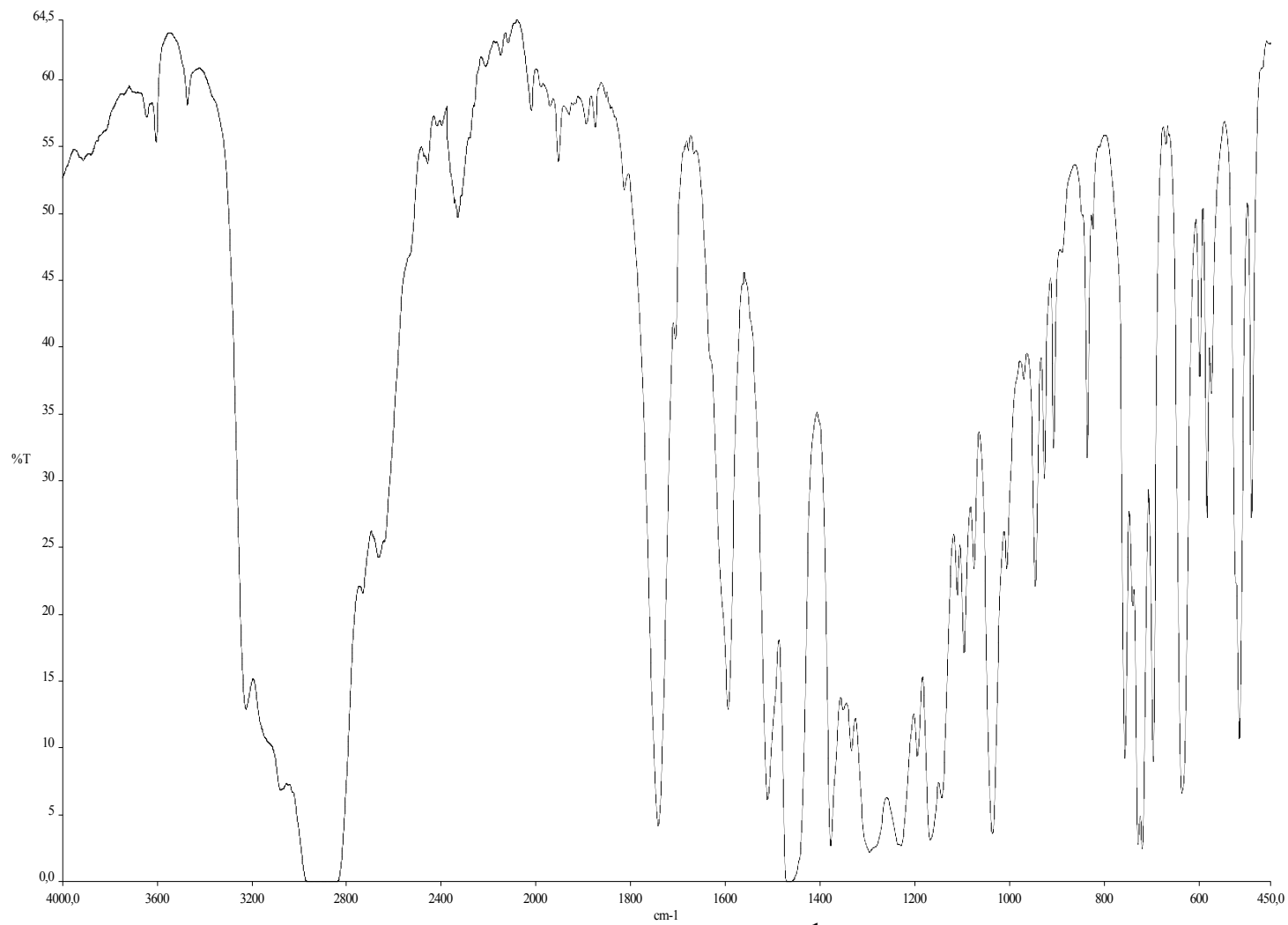
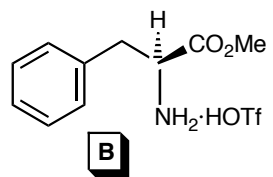
IR spectrum of A (Nujol, cm<sup>-1</sup>)



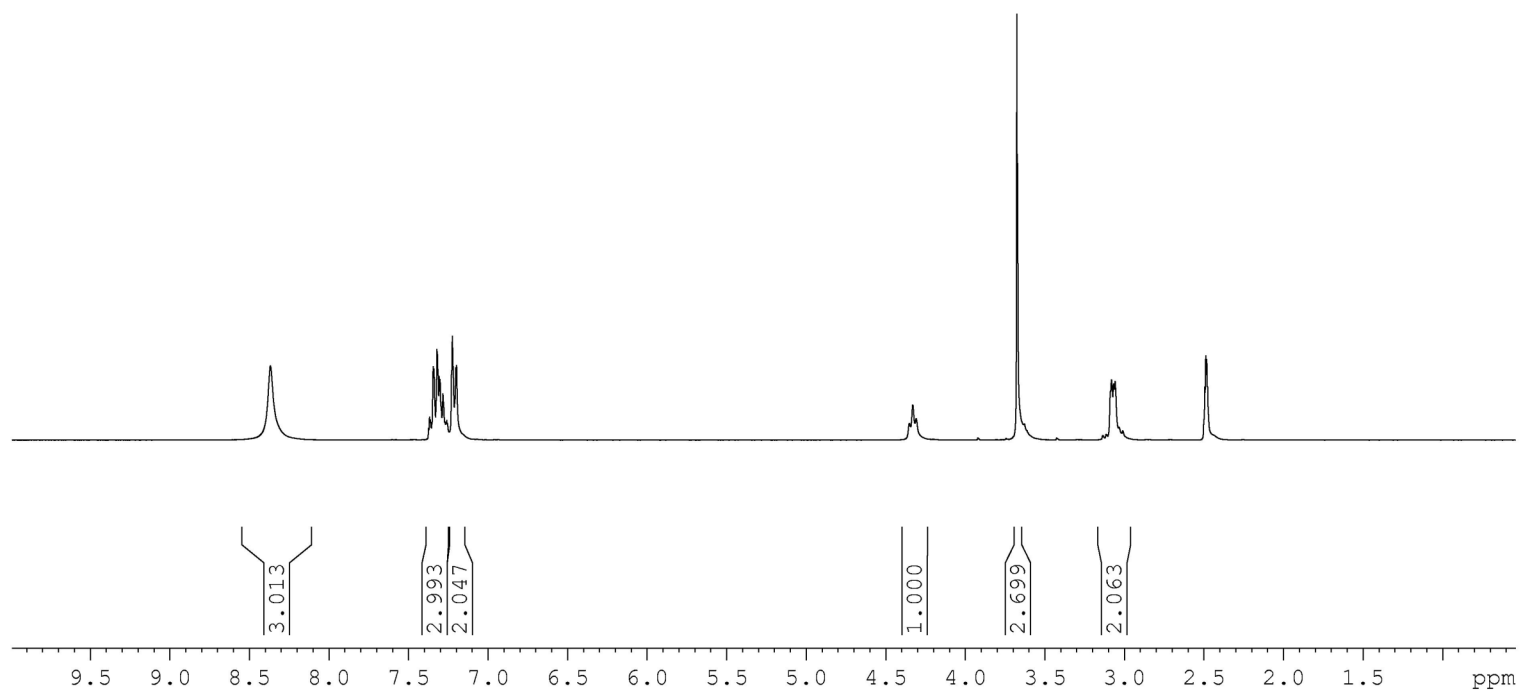
$^1\text{H}$  NMR spectrum of A ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



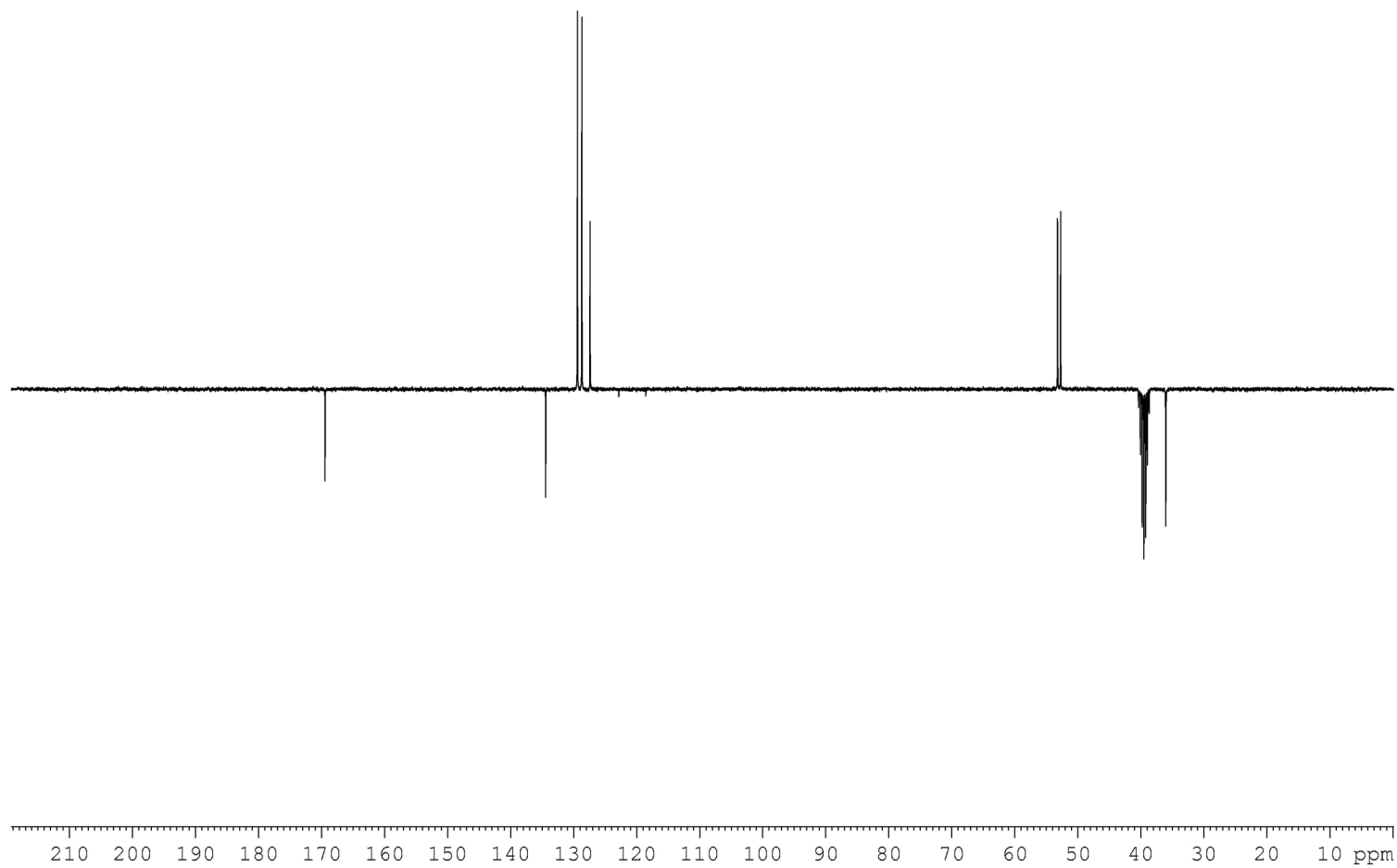
$^{13}\text{C}$  APT NMR spectrum of A (DMSO- $d_6$ , 25 °C)



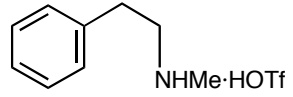
IR spectrum of B (Nujol, cm<sup>-1</sup>)



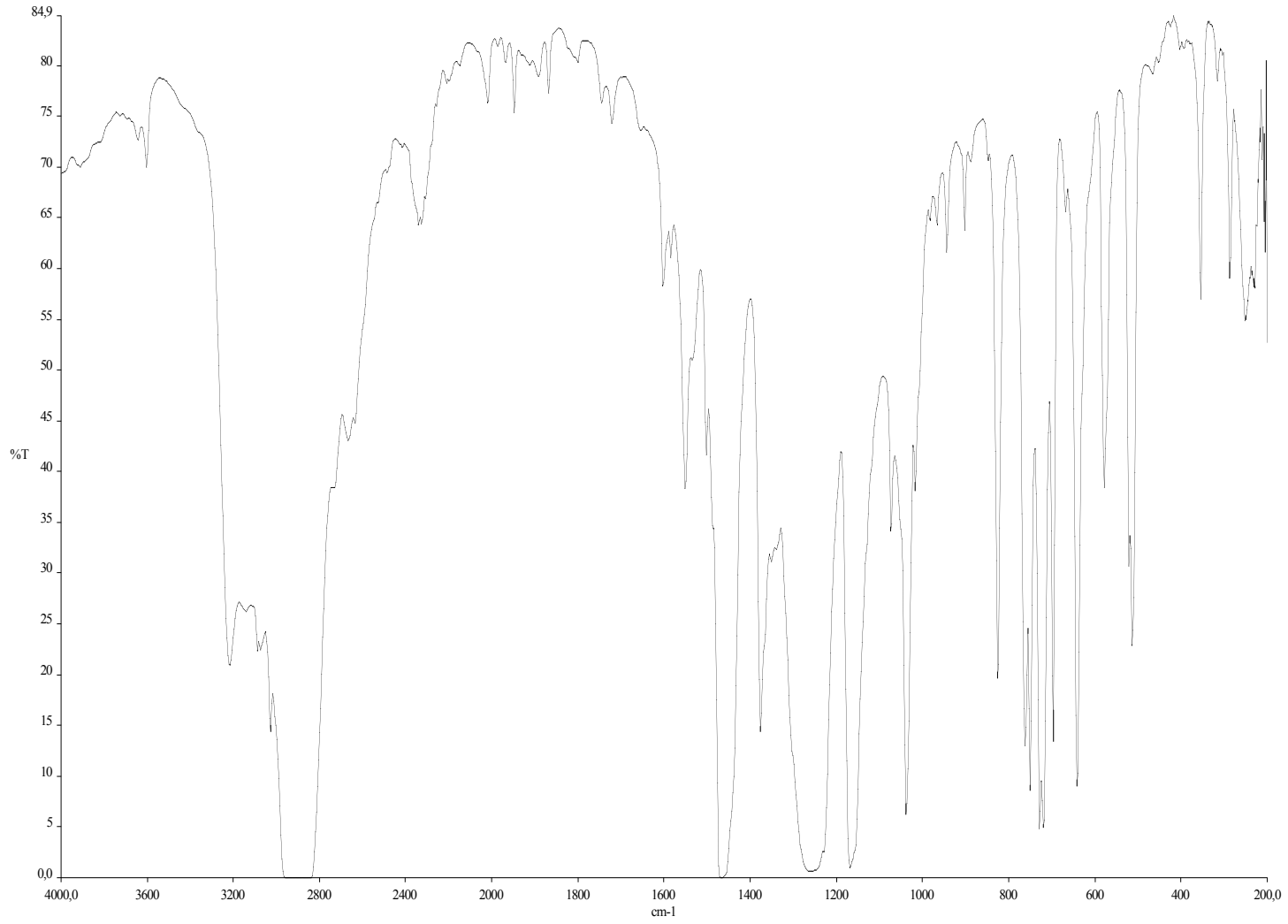
$^1\text{H}$  NMR spectrum of B ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



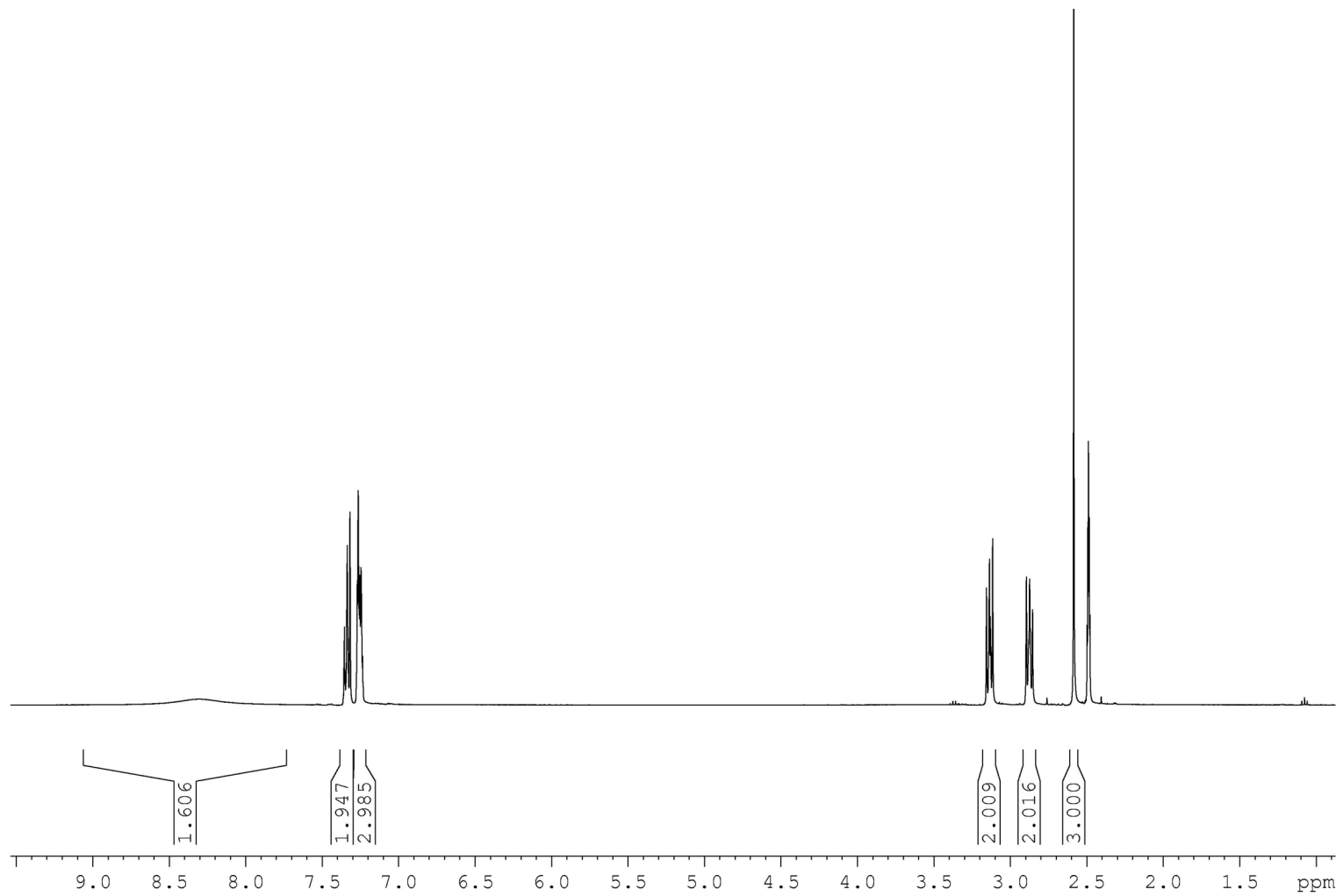
$^{13}\text{C}$  APT NMR spectrum of C (DMSO- $d_6$ , 25 °C)



C

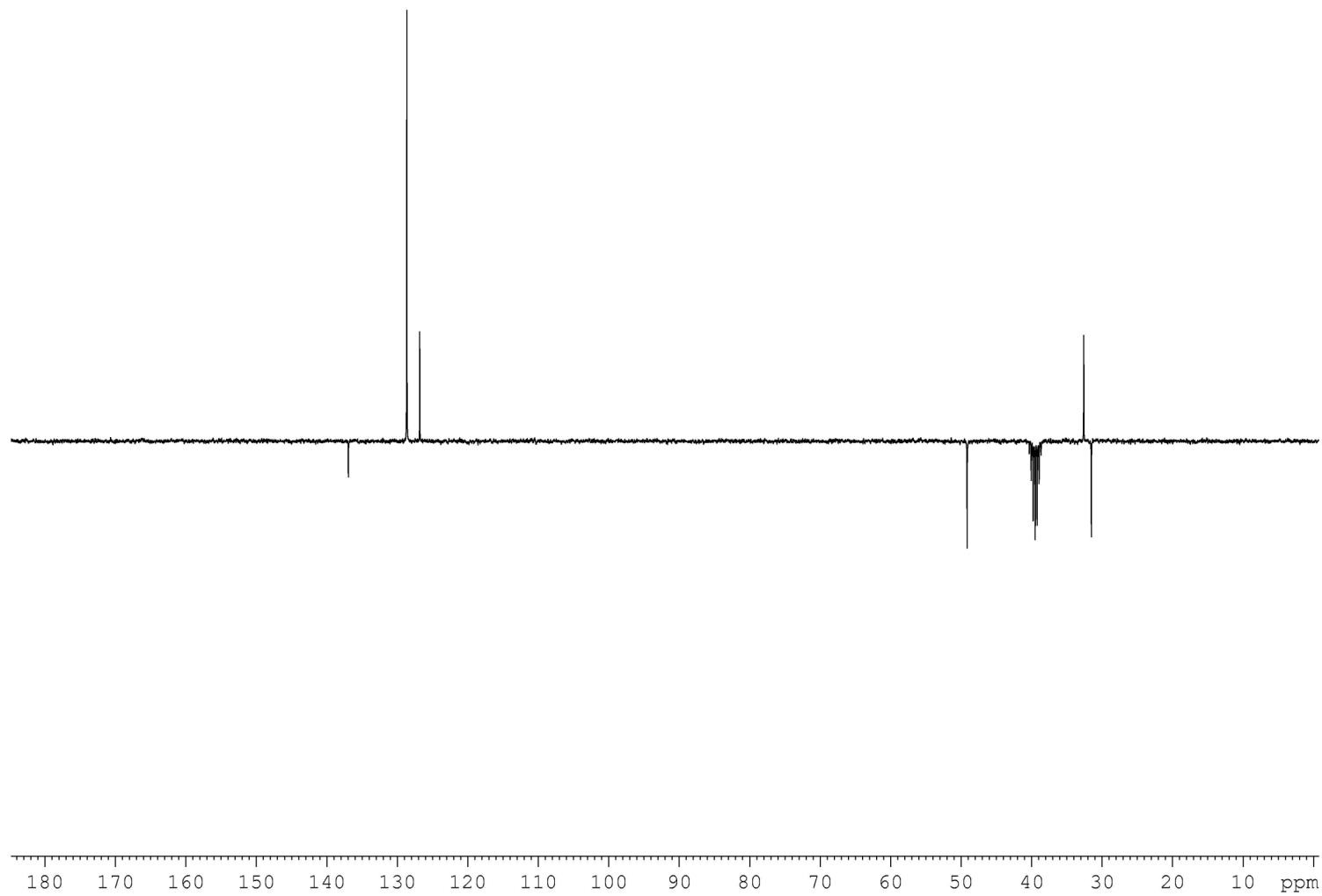


IR spectrum of C (Nujol, cm<sup>-1</sup>)

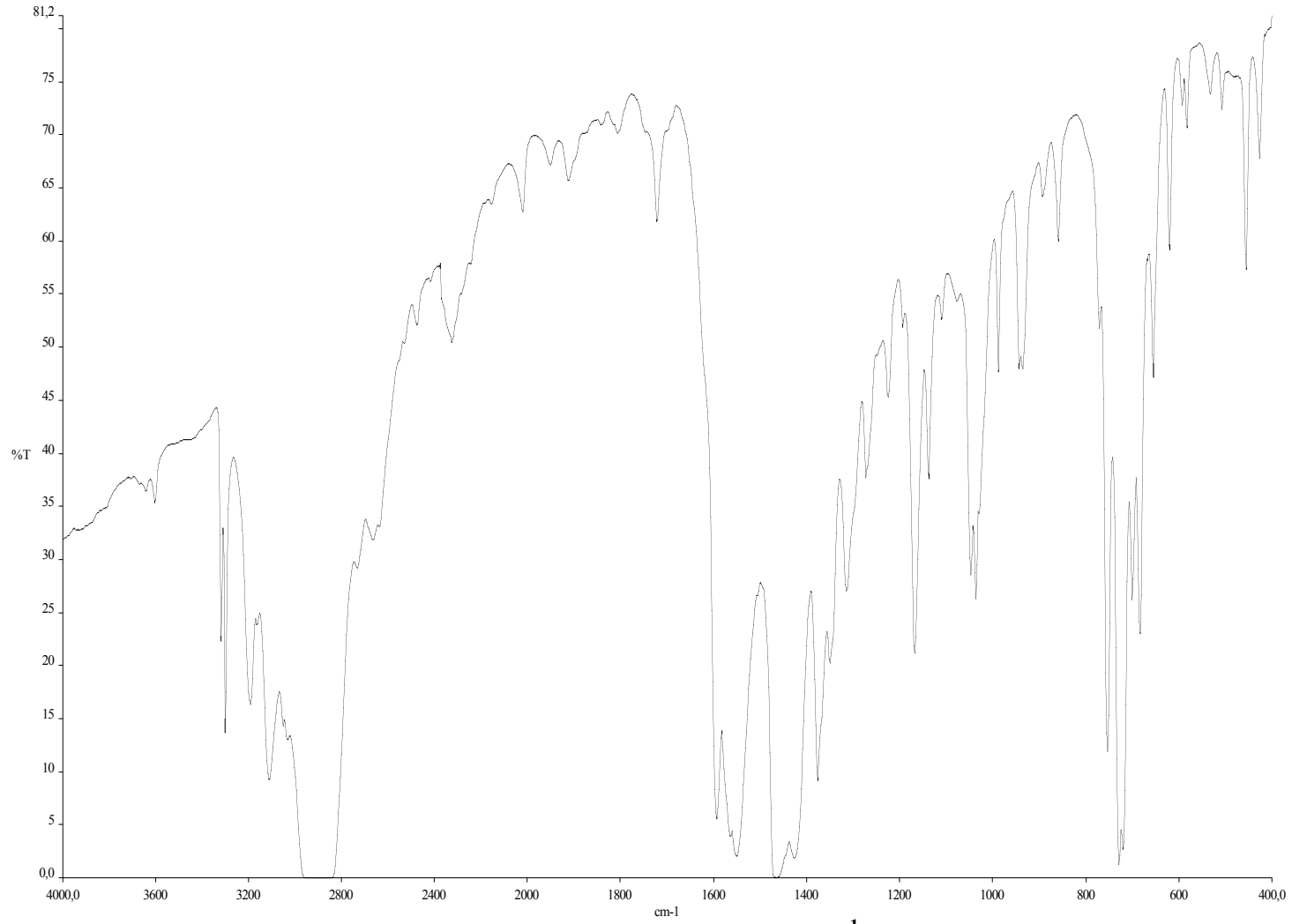
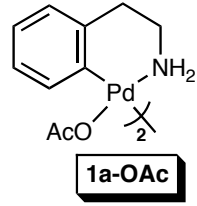


$^1\text{H}$  NMR spectrum of C ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )

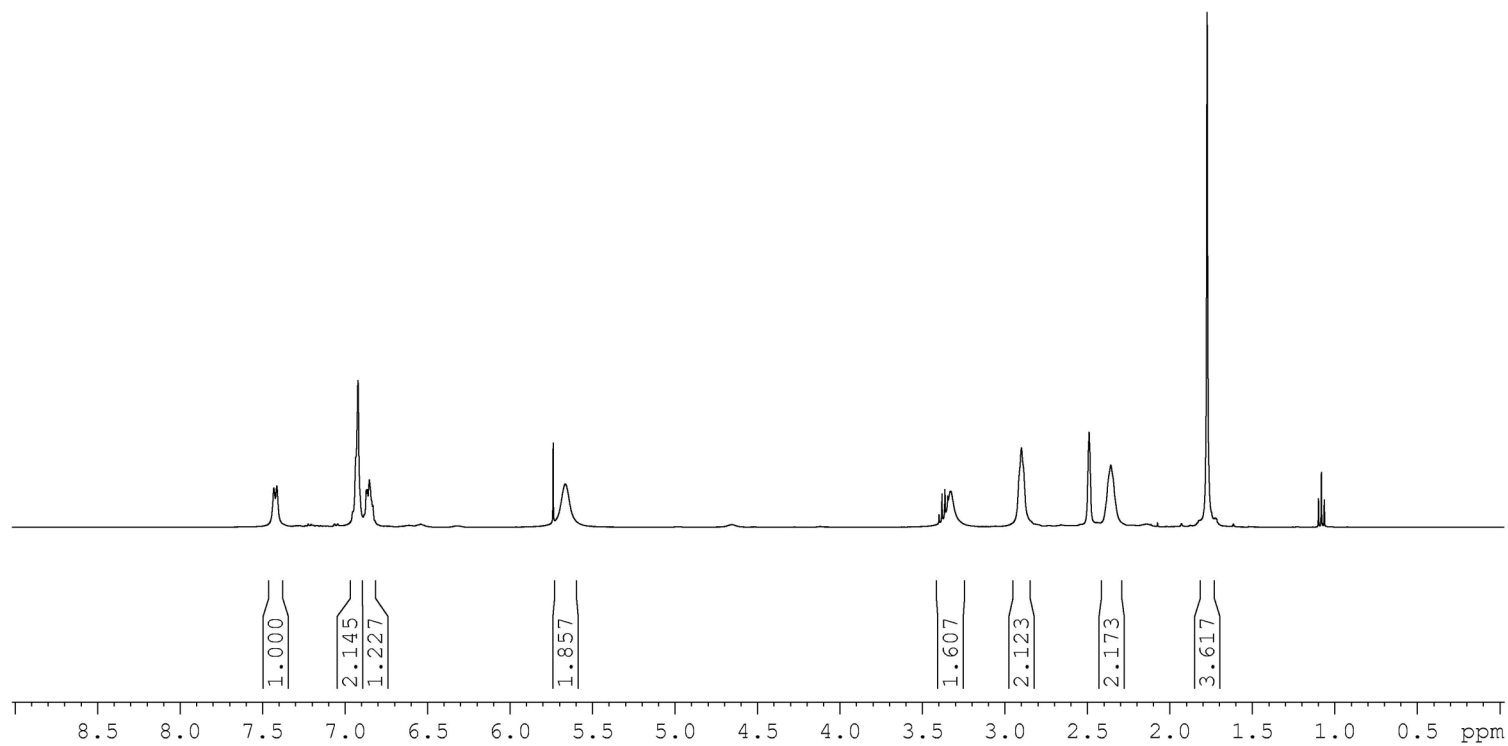




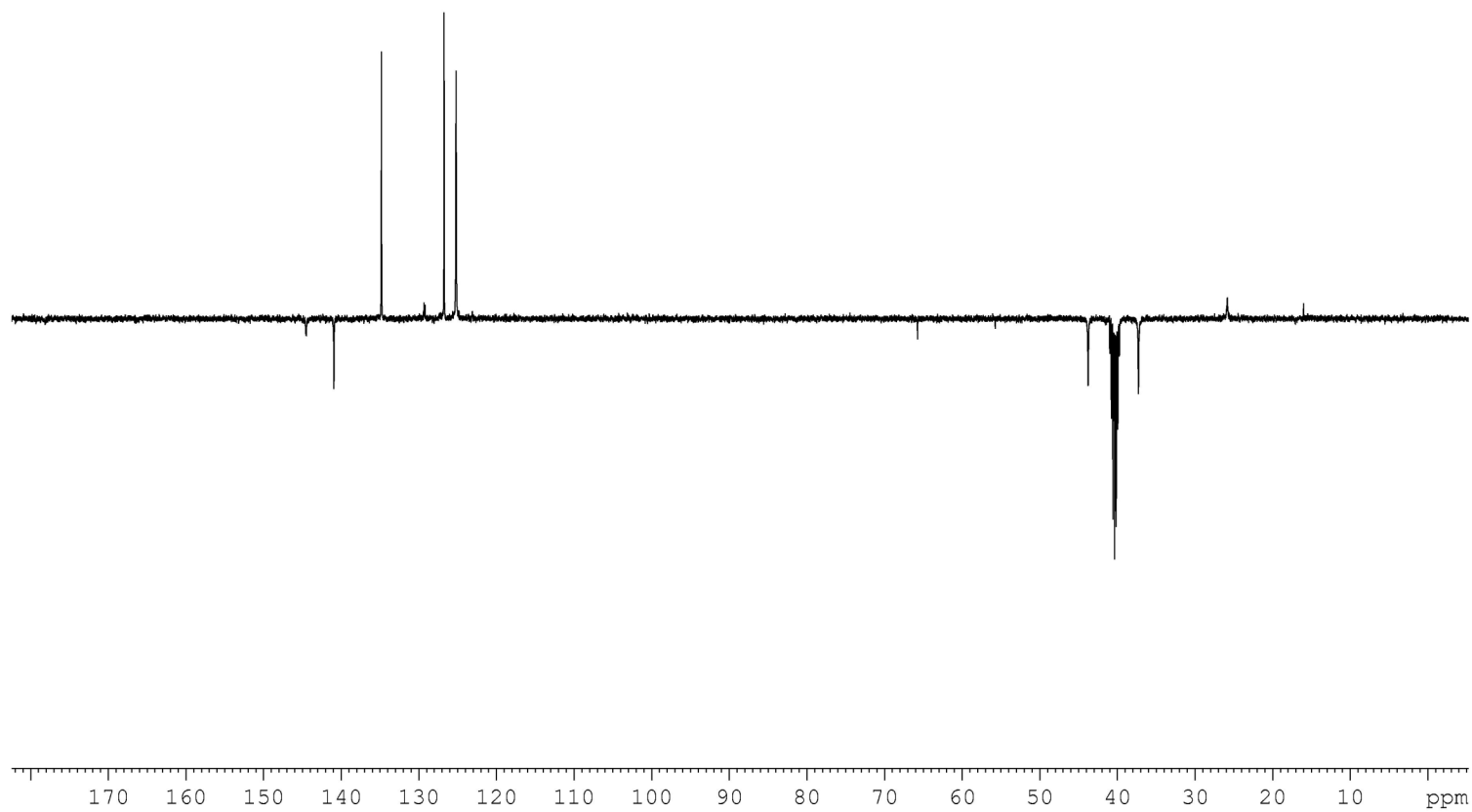
$^{13}\text{C}$  APT NMR spectrum of C (DMSO- $d_6$ , 25 °C)



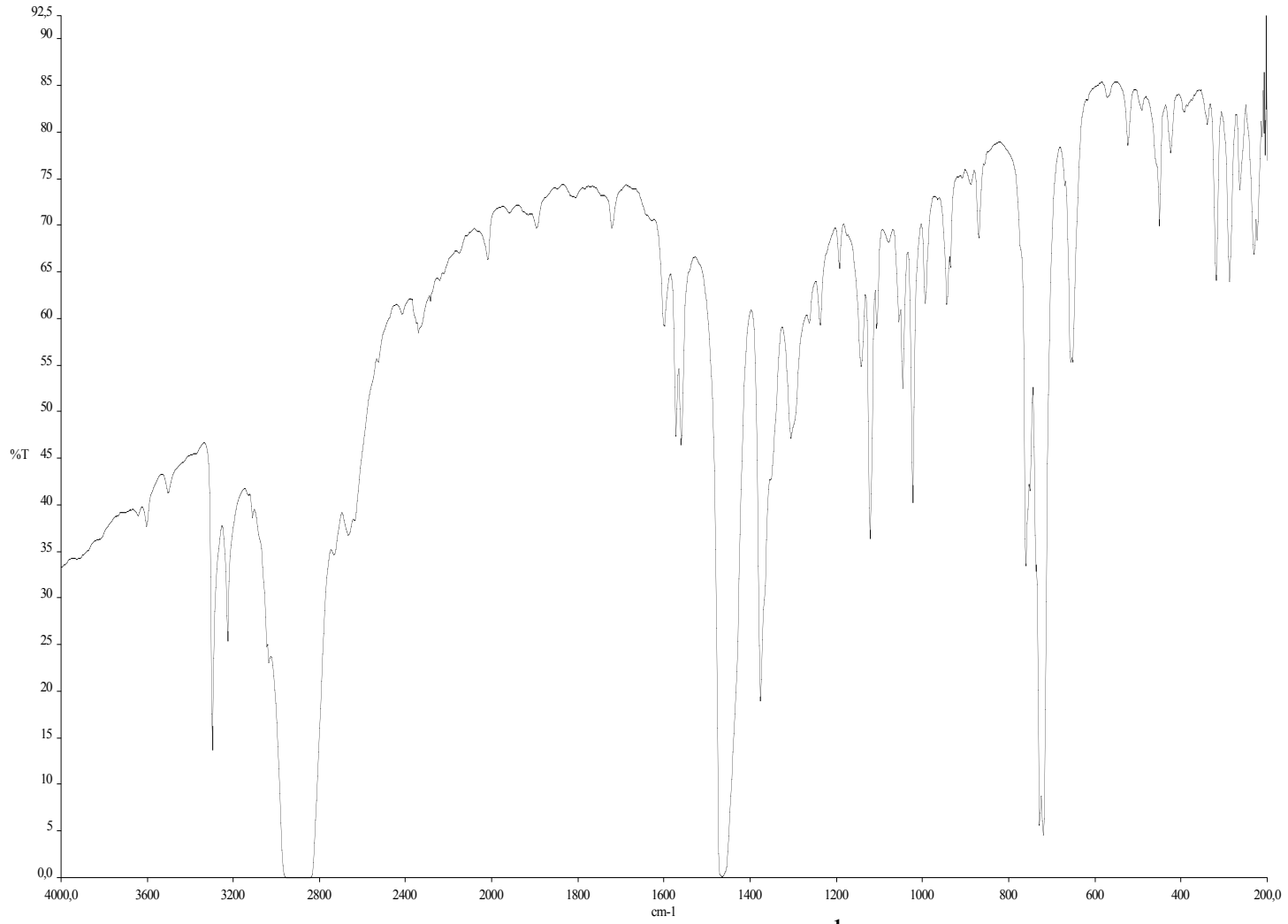
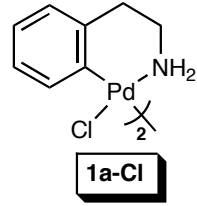
**IR spectrum of 1a-OAc (Nujol, cm<sup>-1</sup>)**



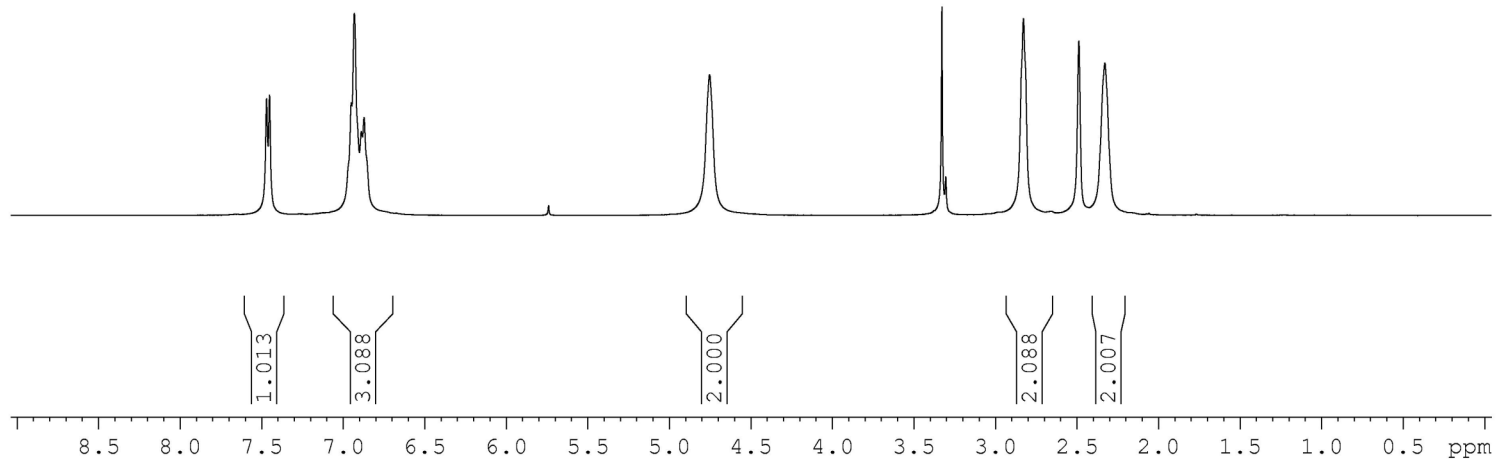
$^1\text{H}$  NMR spectrum of 1a-OAc ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



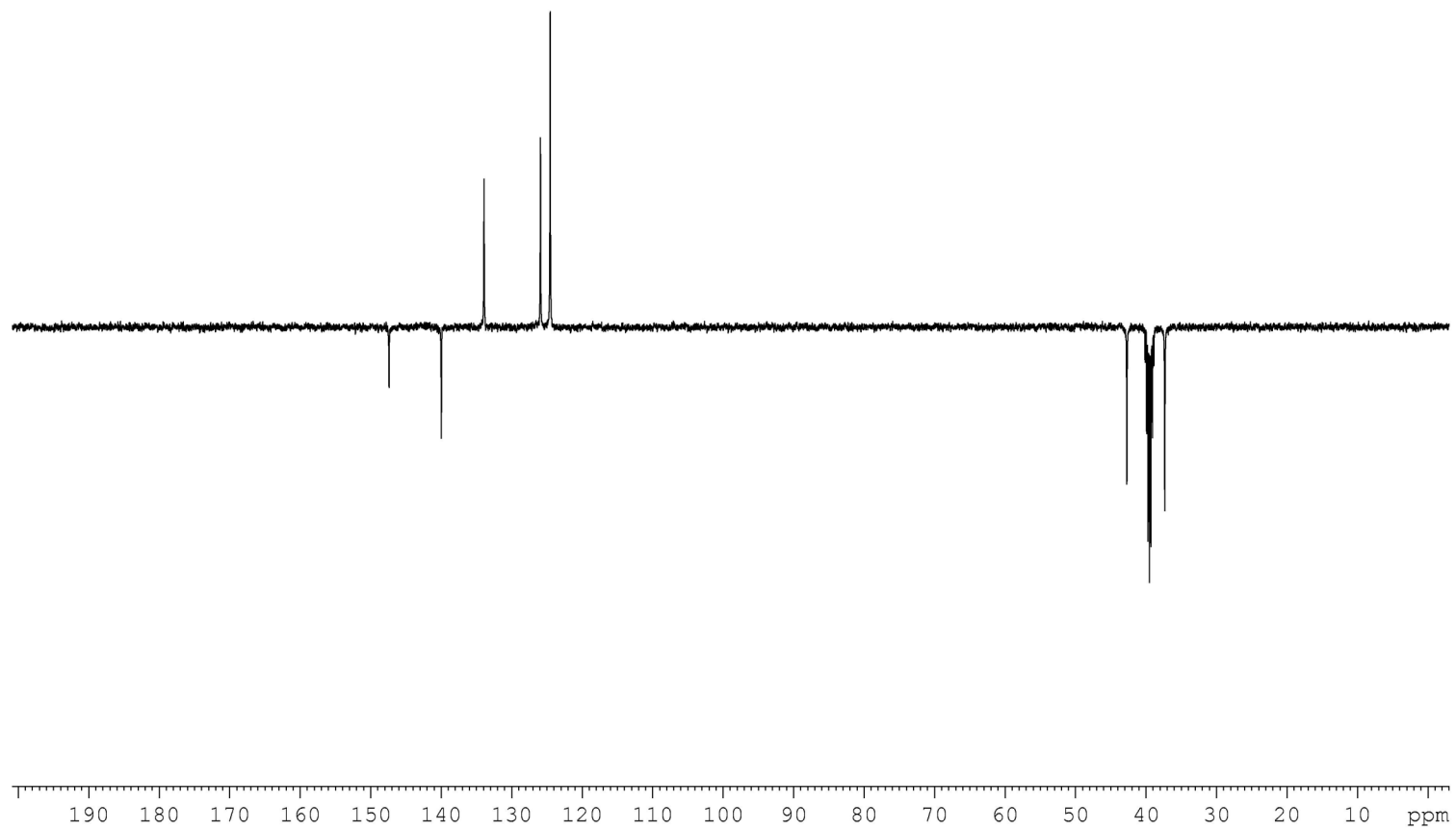
$^{13}\text{C}$  APT NMR spectrum of 1a-OAc (DMSO- $d_6$ , 25 °C)



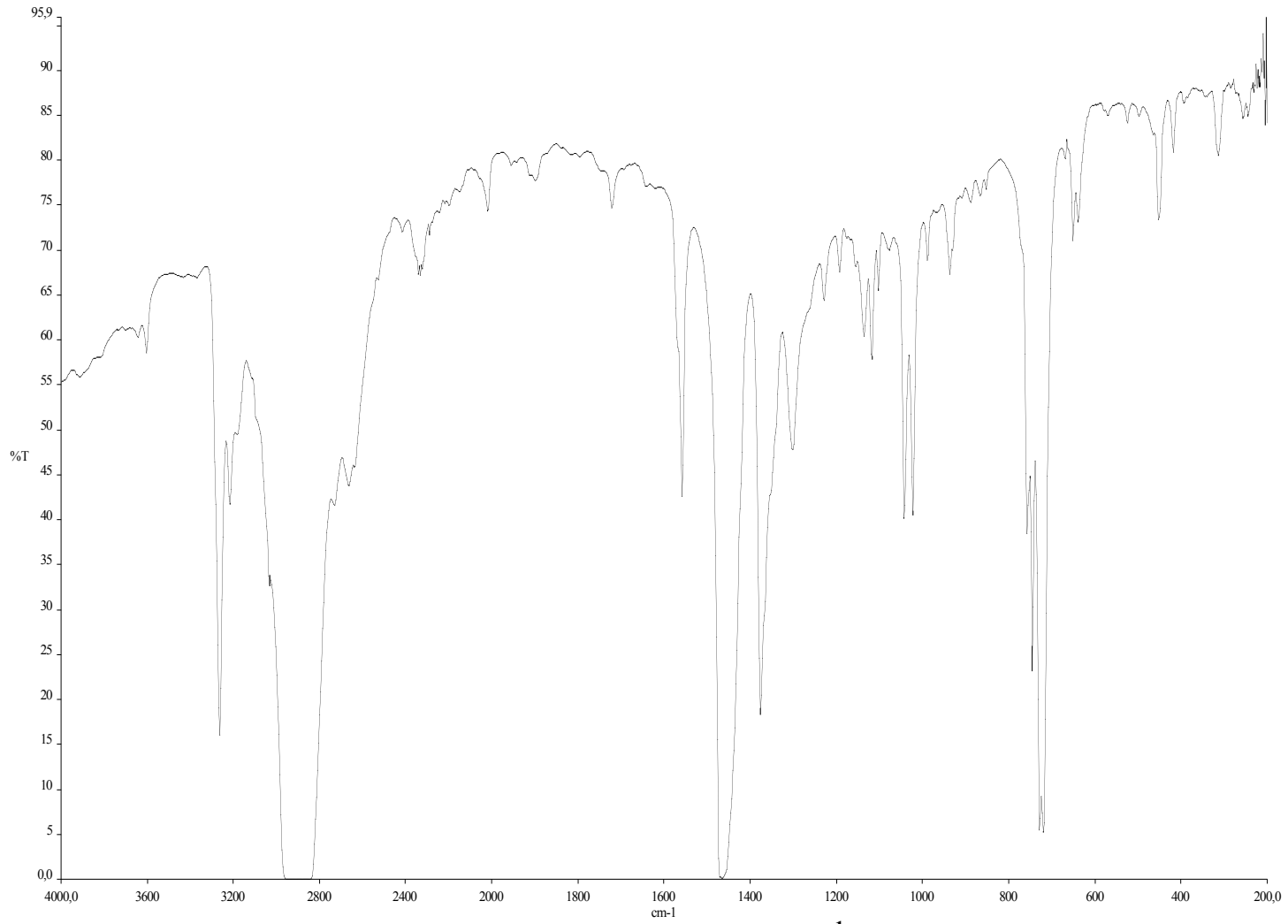
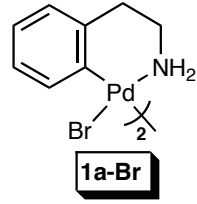
**IR spectrum of 1a-Cl (Nujol, cm<sup>-1</sup>)**



$^1\text{H}$  NMR spectrum of 1a-Cl (DMSO- $d_6$ , 25 °C)

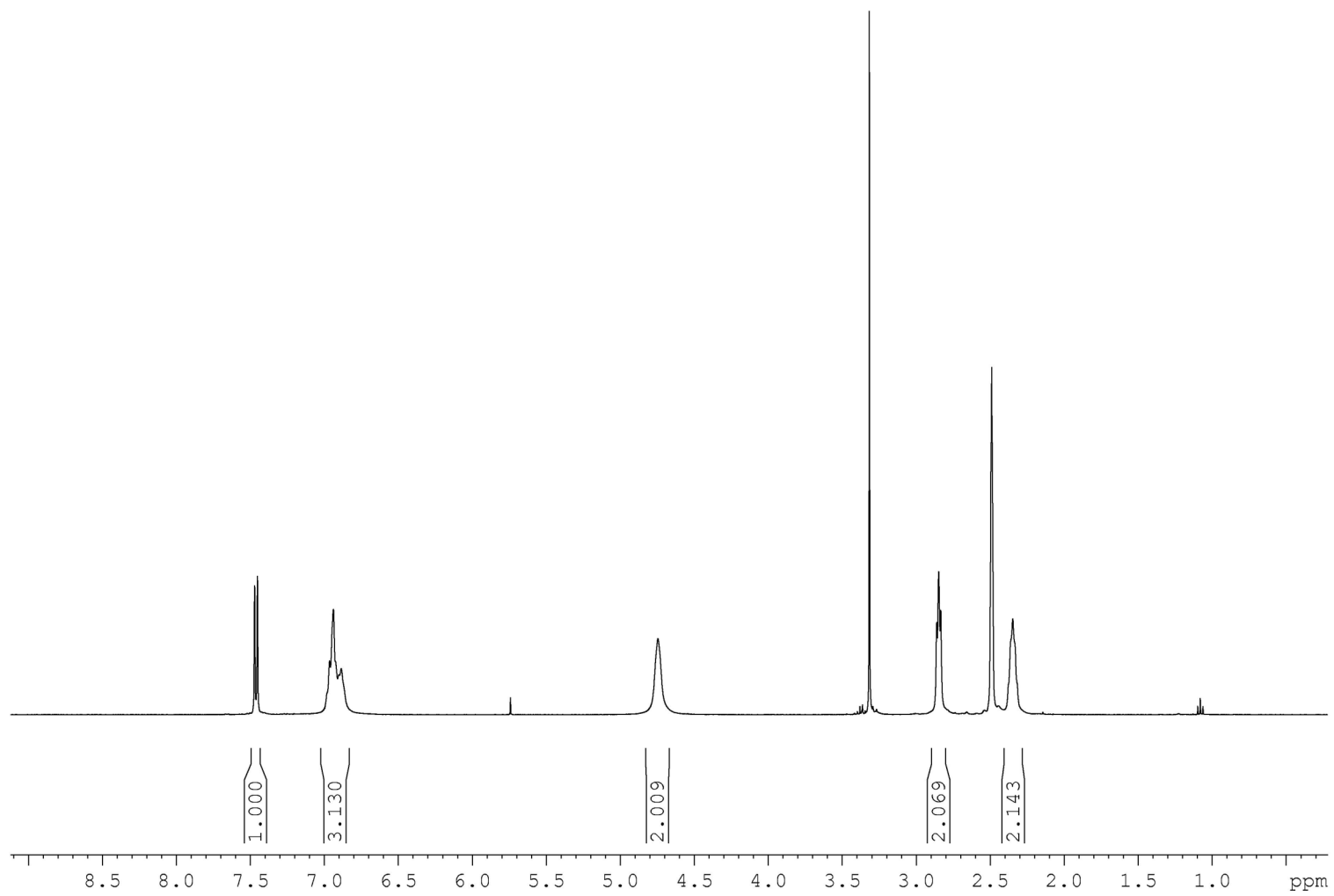


$^{13}\text{C}$  APT NMR spectrum of 1a-Cl (DMSO- $d_6$ , 25 °C)

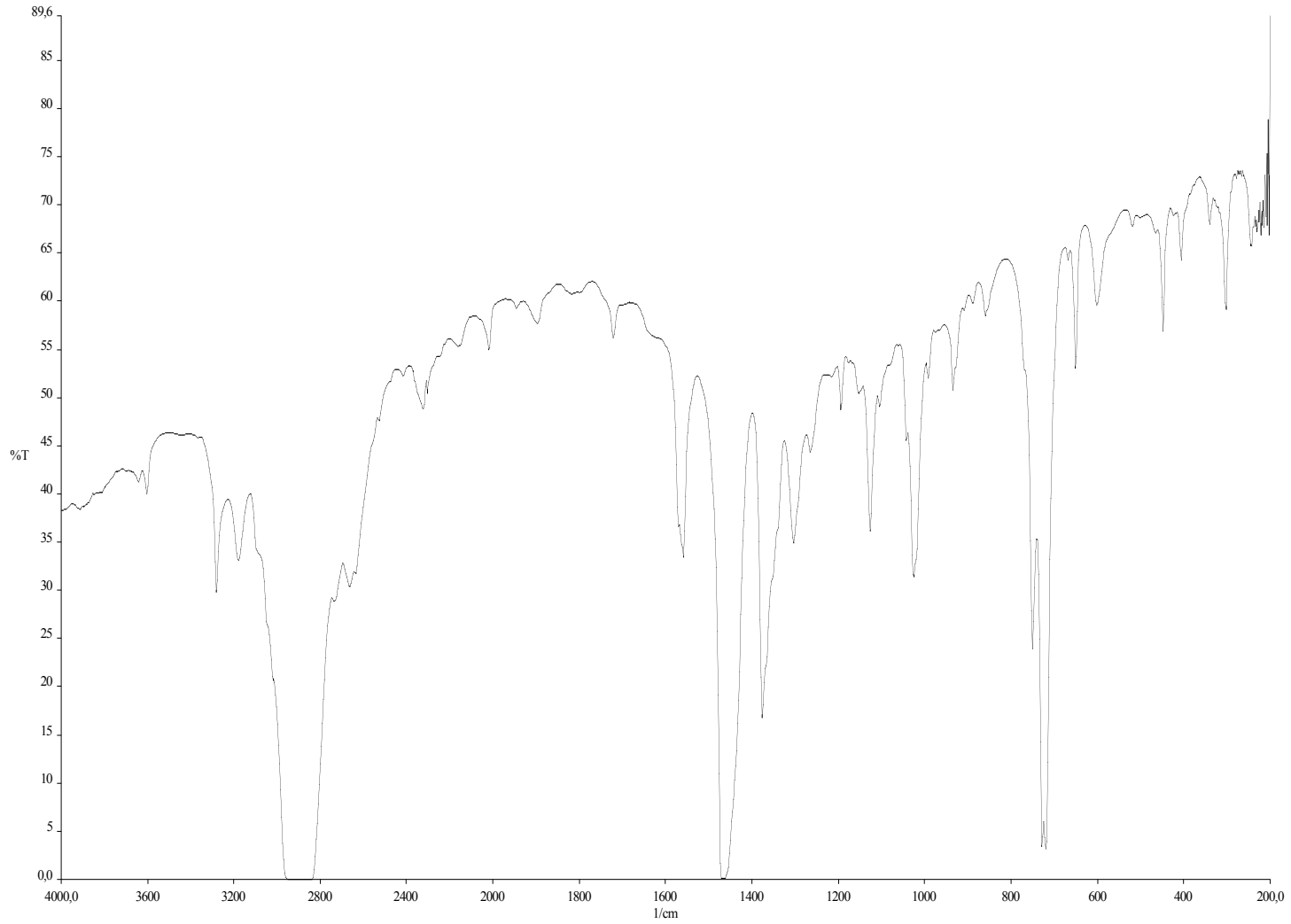
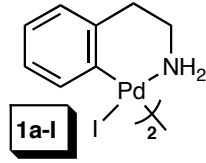


**IR spectrum of 1a-Br (Nujol, cm<sup>-1</sup>)**

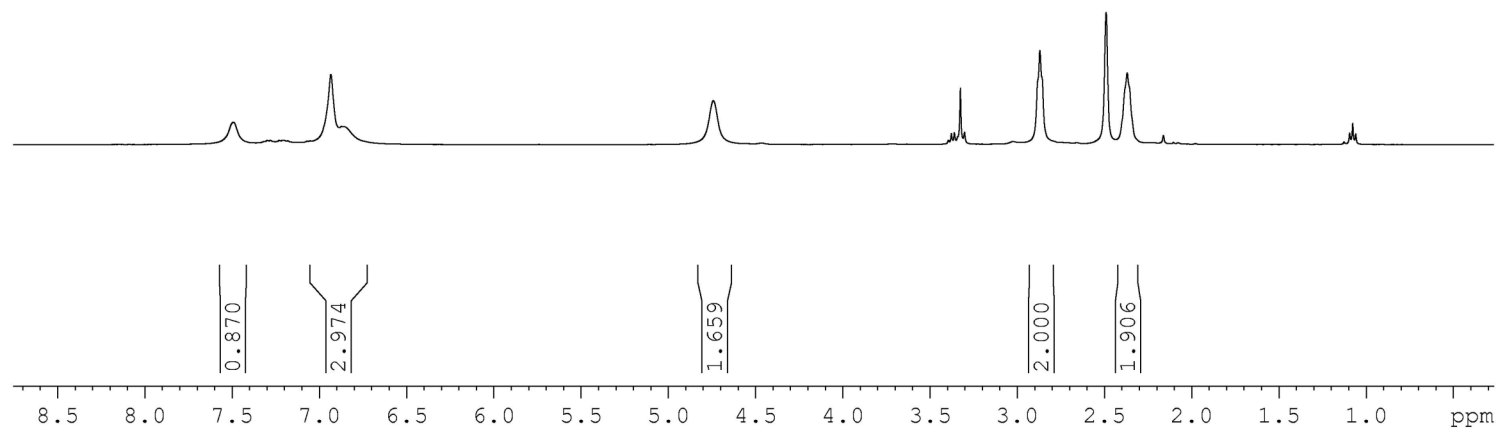




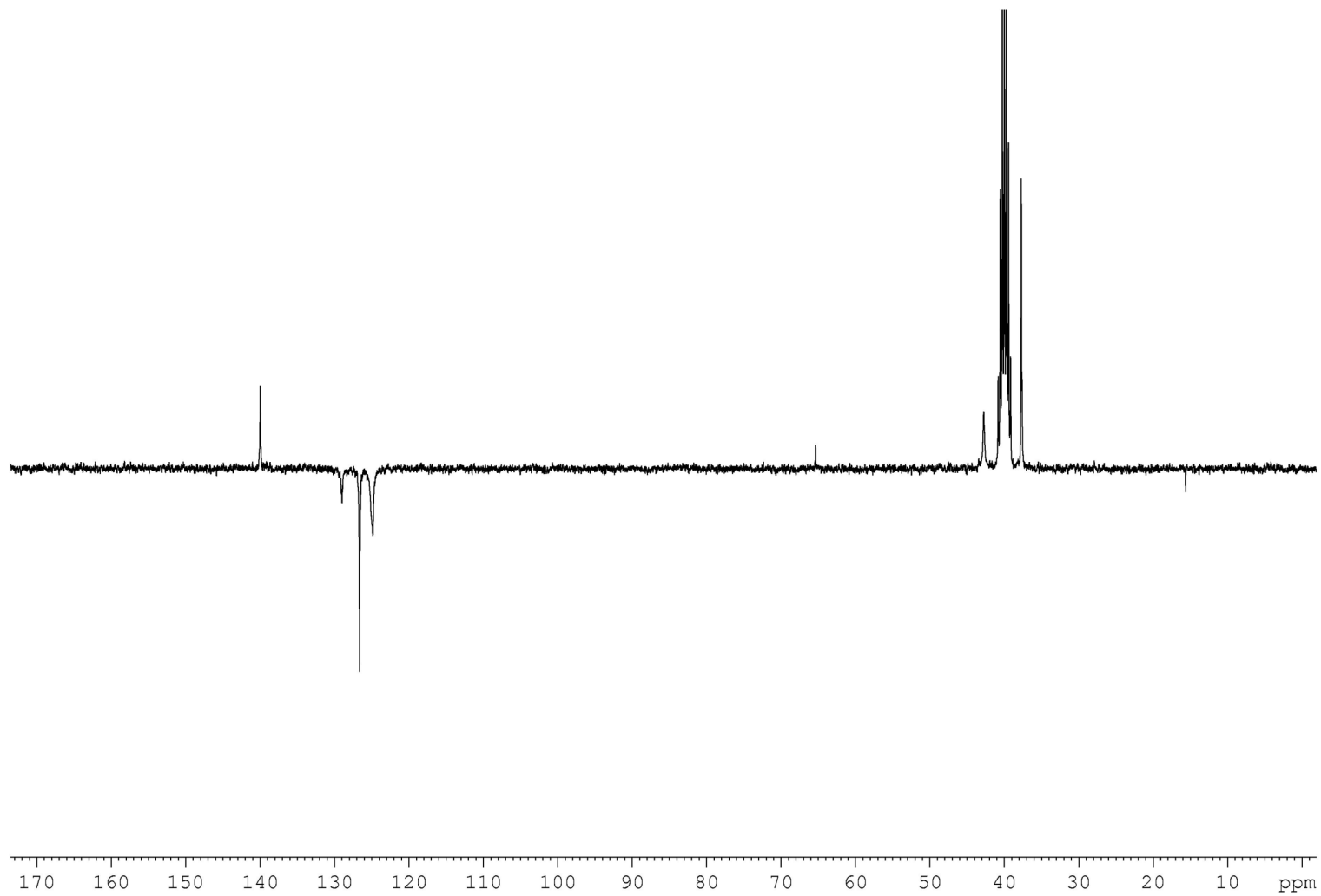
$^1\text{H}$  NMR spectrum of 1a-Br ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



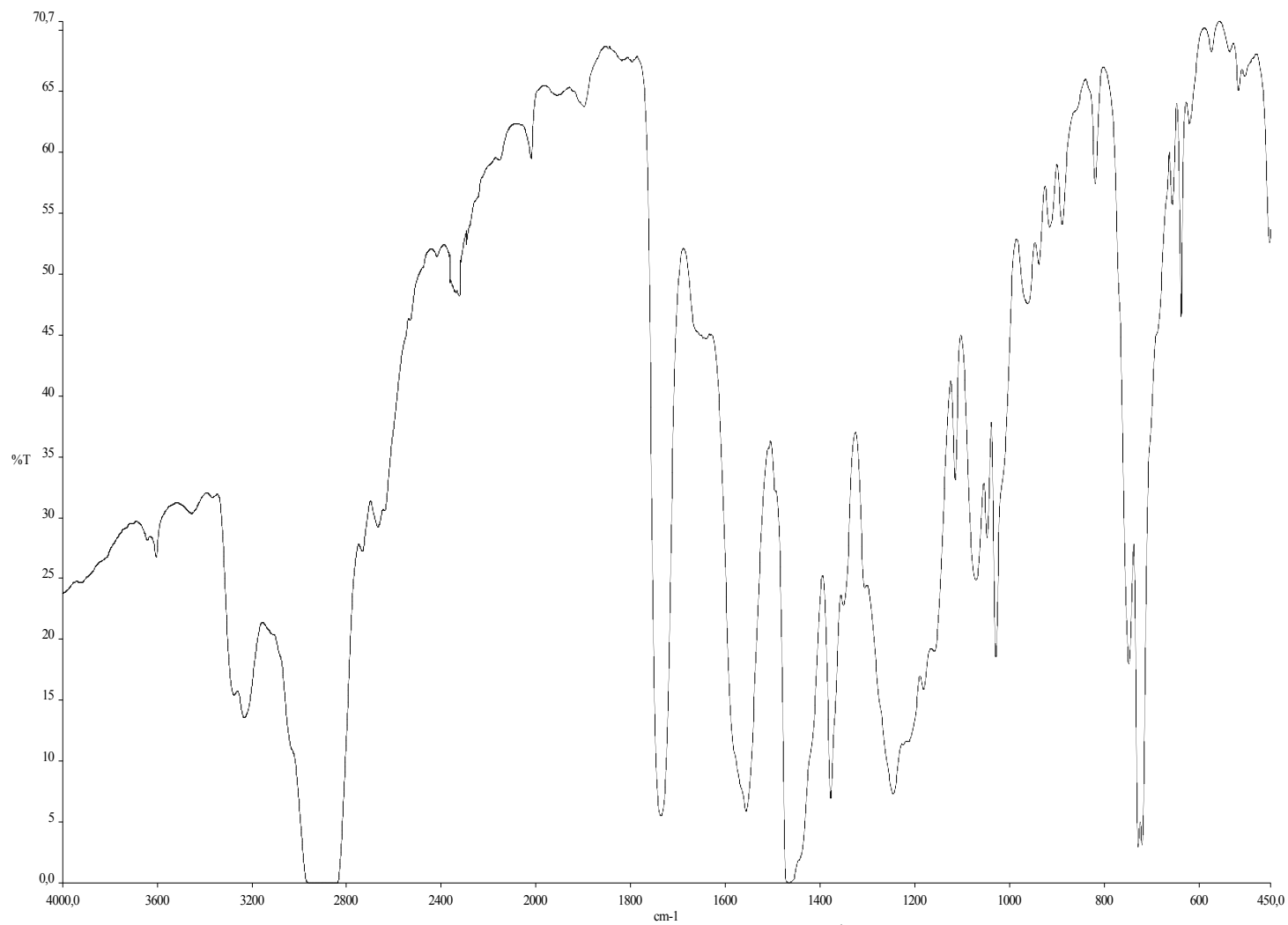
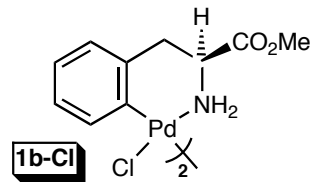
**IR spectrum of 1a-I (Nujol, cm<sup>-1</sup>)**



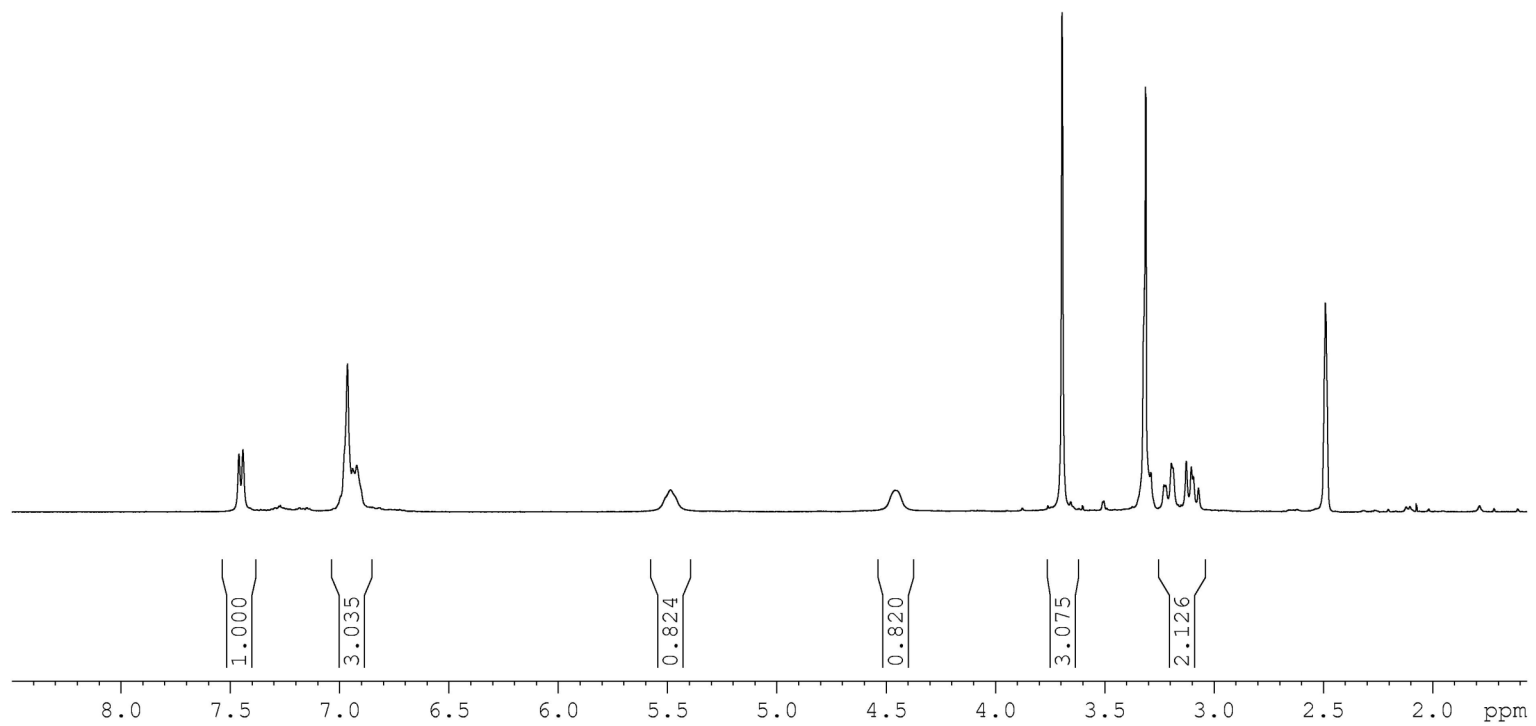
$^1\text{H}$  NMR spectrum of 1a-I ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



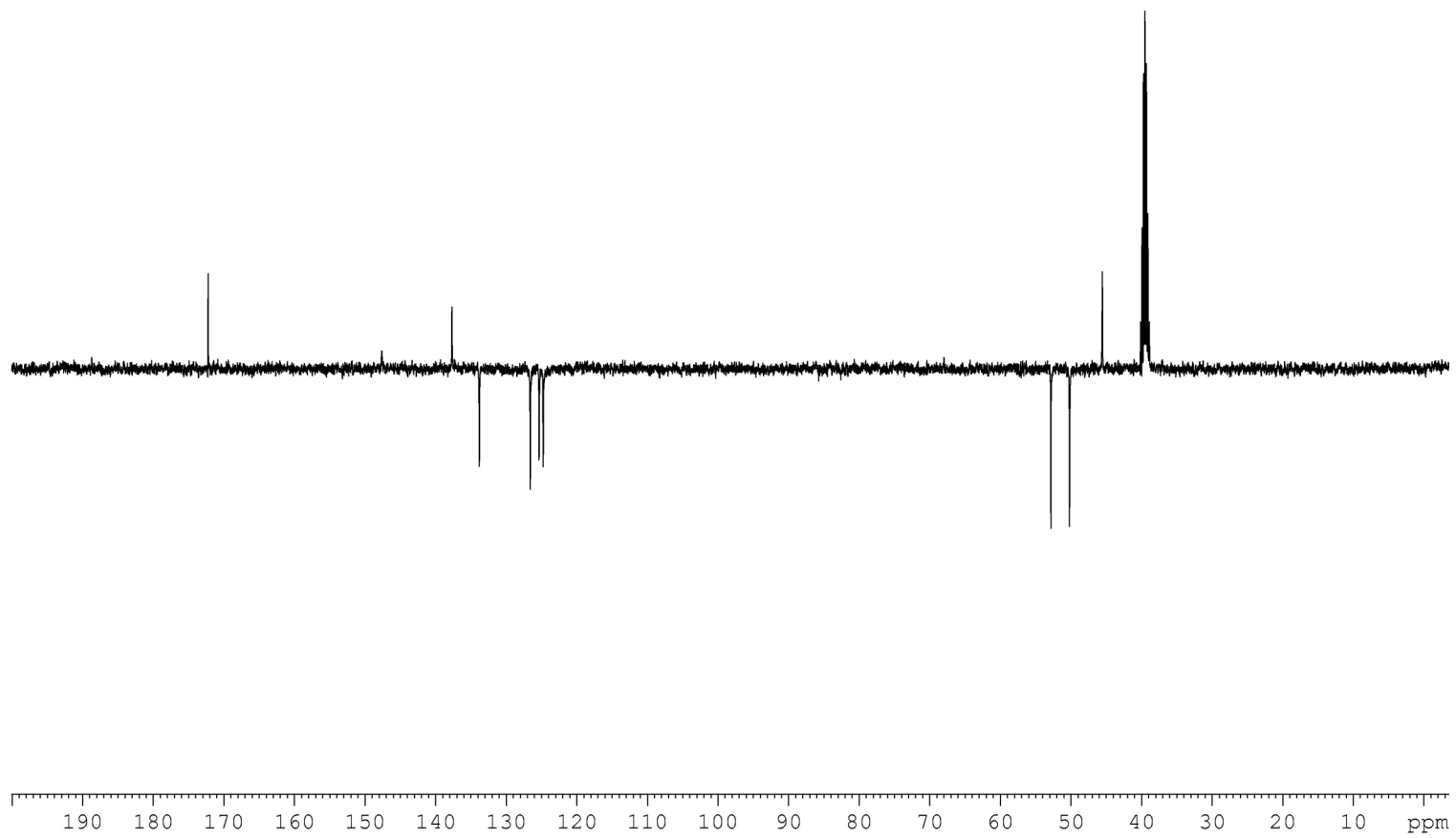
$^{13}\text{C}$  APT NMR spectrum of 1a-I (DMSO- $d_6$ , 25 °C)



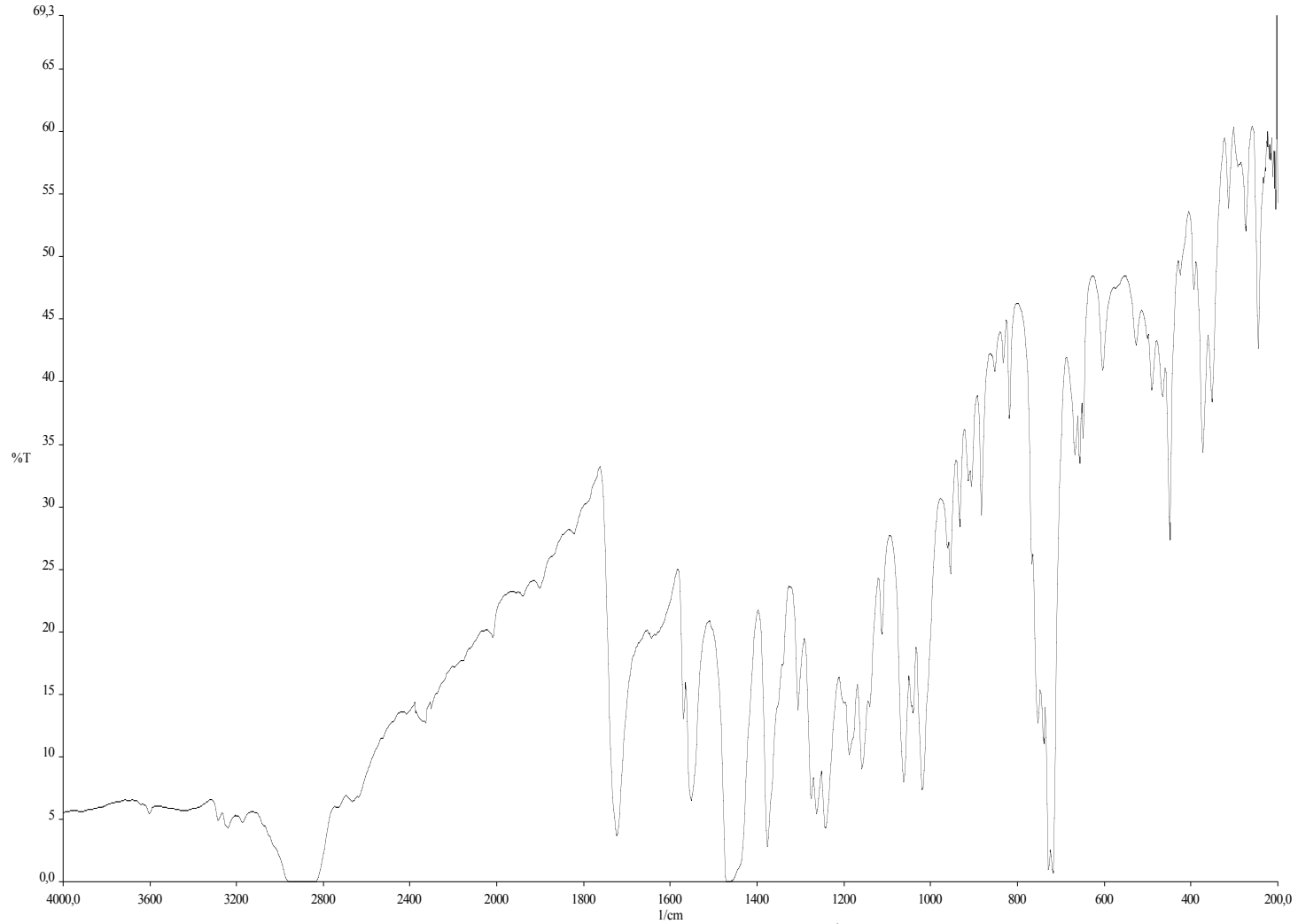
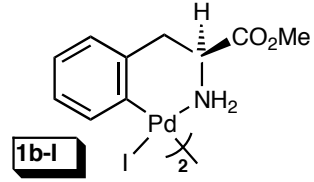
IR spectrum of 1b-Cl (Nujol,  $\text{cm}^{-1}$ )



$^1\text{H}$  NMR spectrum of **1b-Cl** ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )

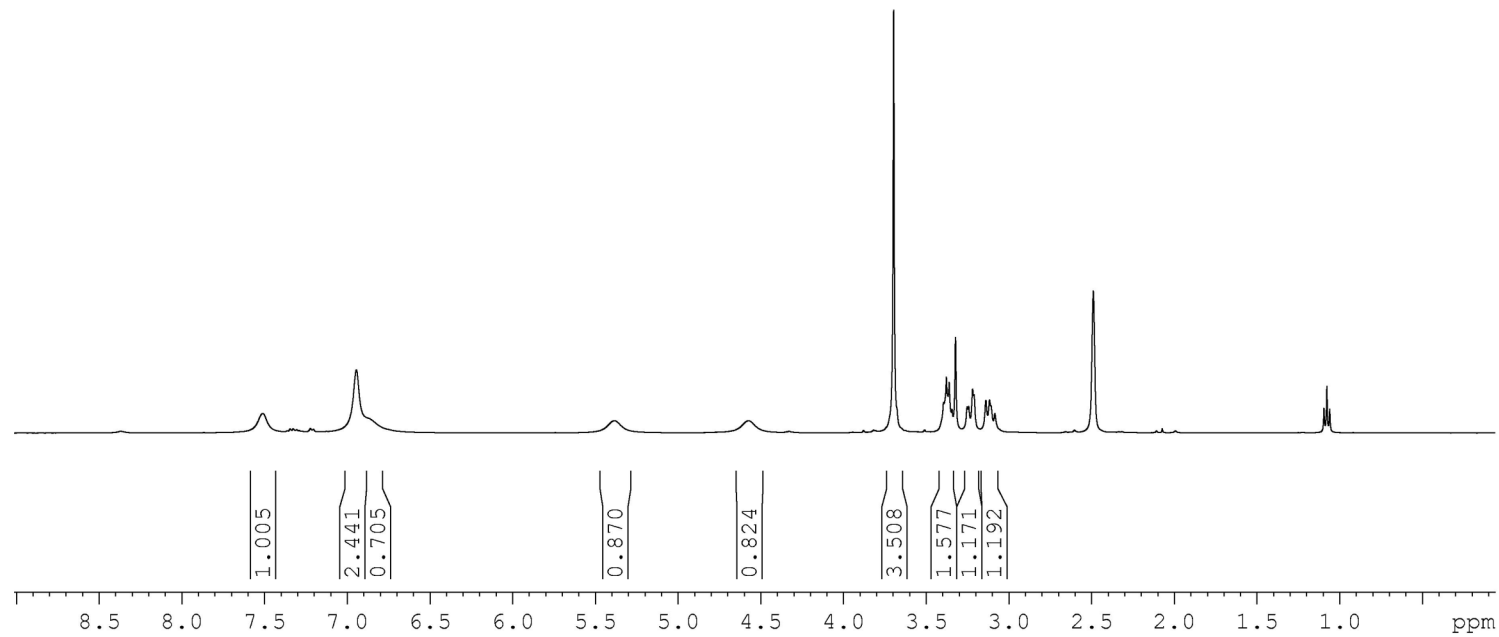


$^{13}\text{C}$  APT NMR spectrum of 1b-Cl (DMSO- $d_6$ , 25 °C)

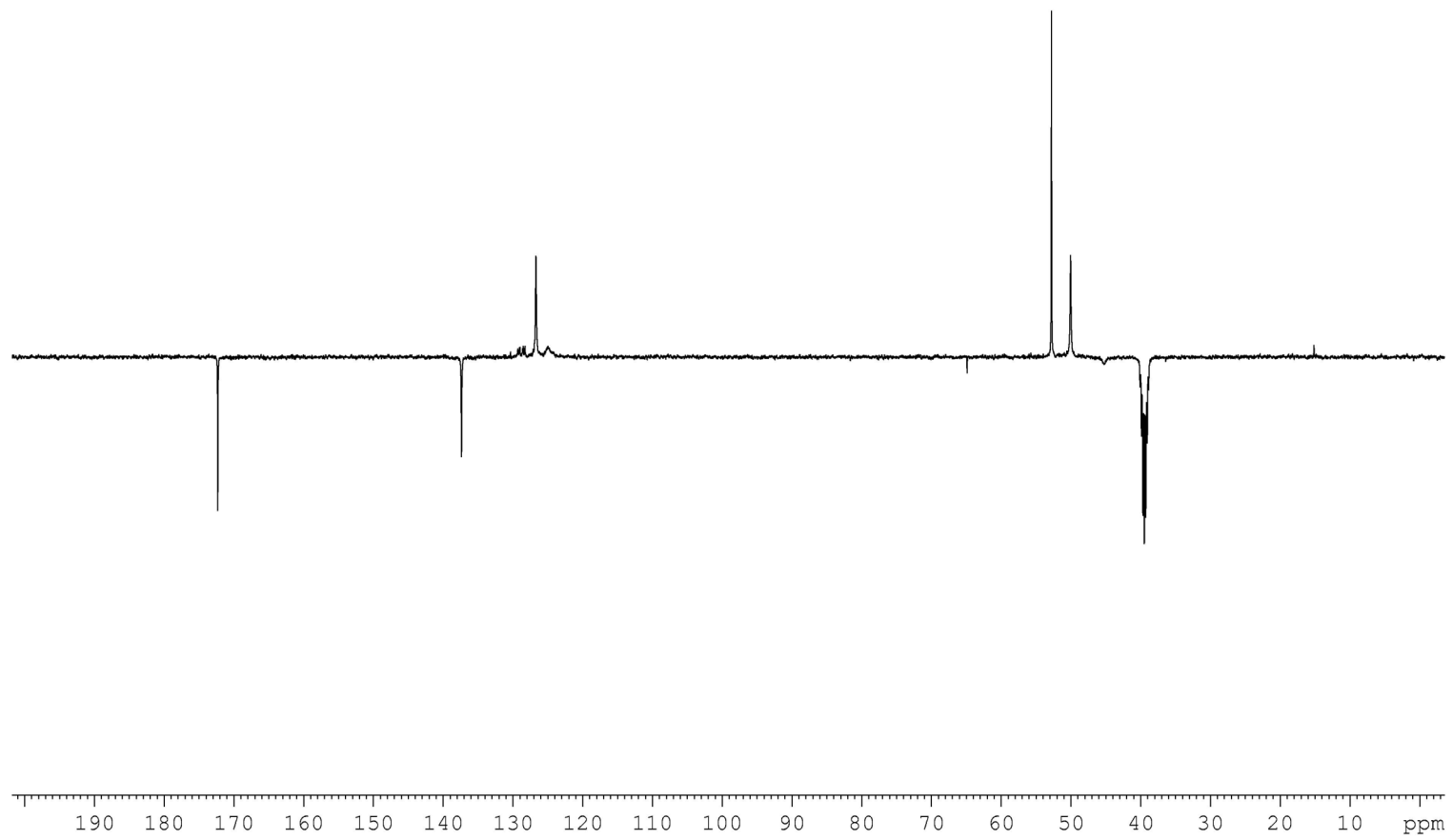


**IR spectrum of 1b-I (Nujol, cm<sup>-1</sup>)**

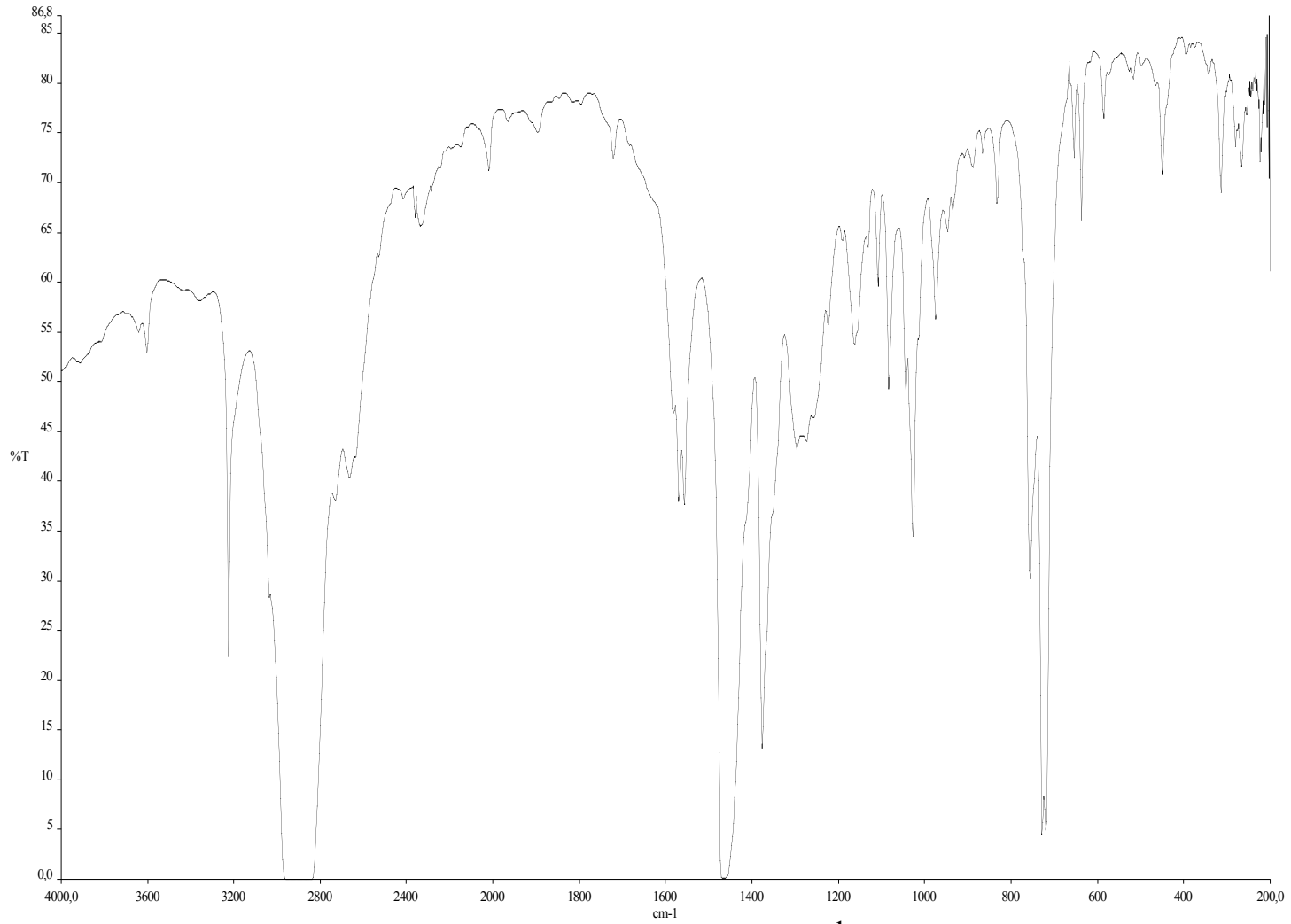
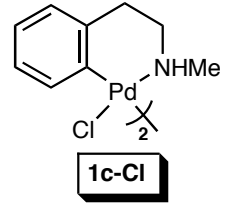




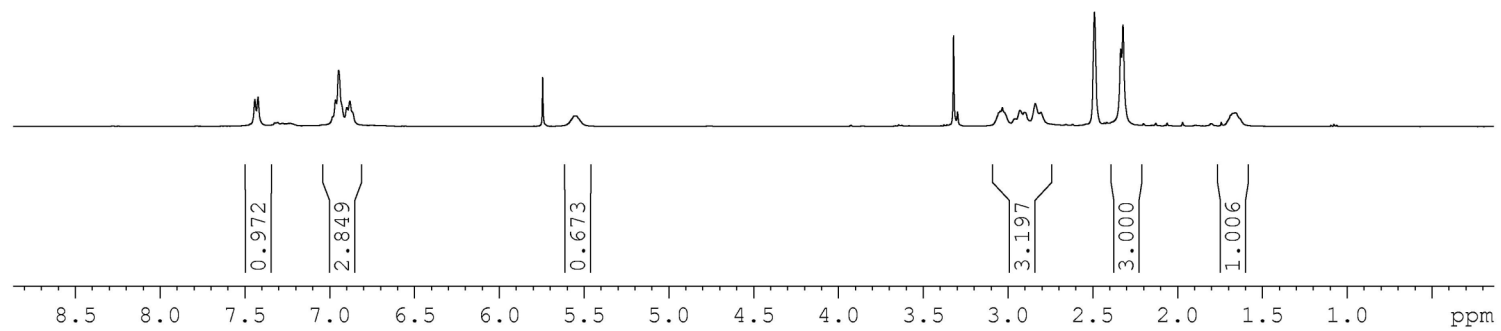
$^1\text{H}$  NMR spectrum of 1b-I ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



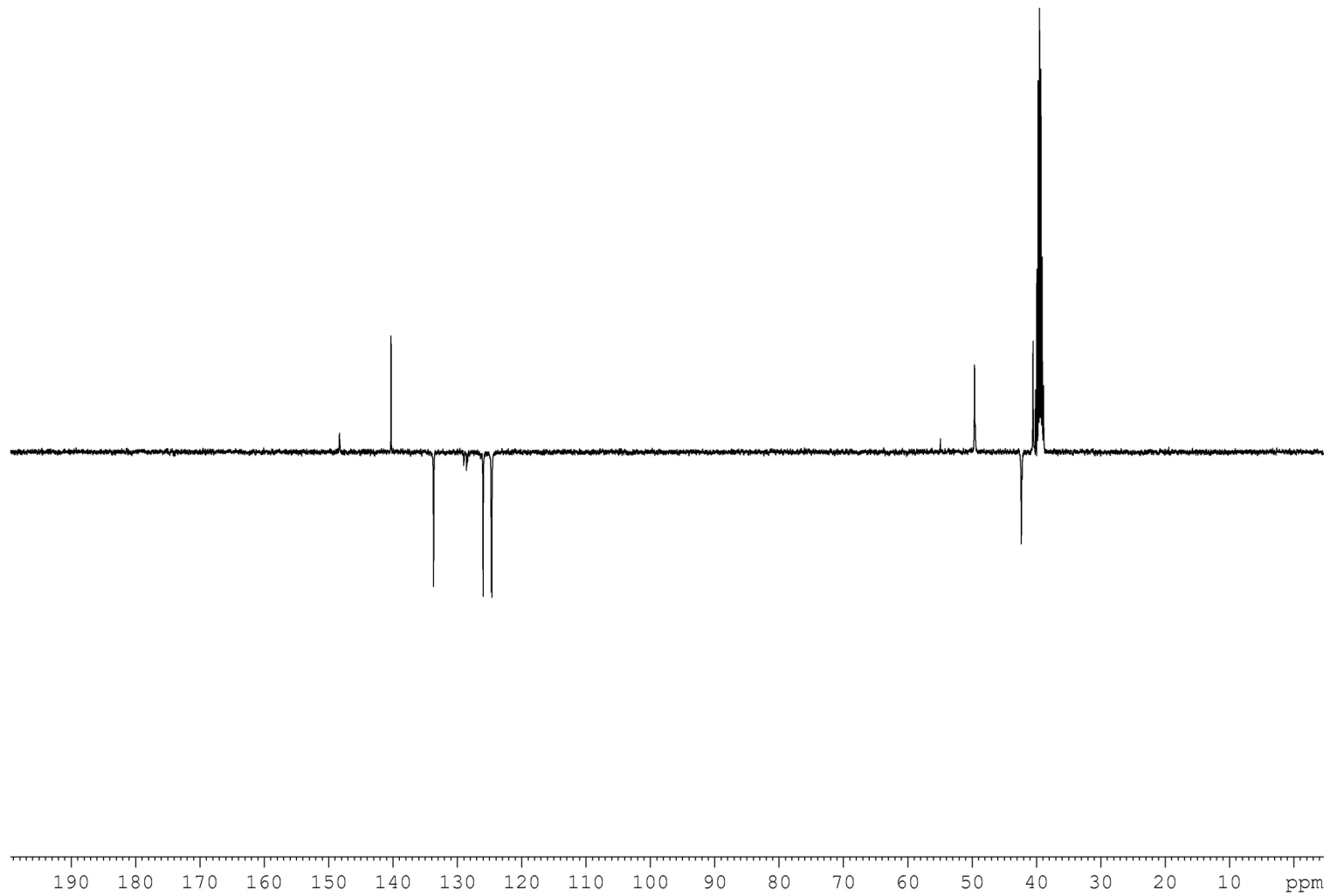
$^{13}\text{C}$  APT NMR spectrum of **1b-I** (DMSO- $d_6$ , 25 °C)



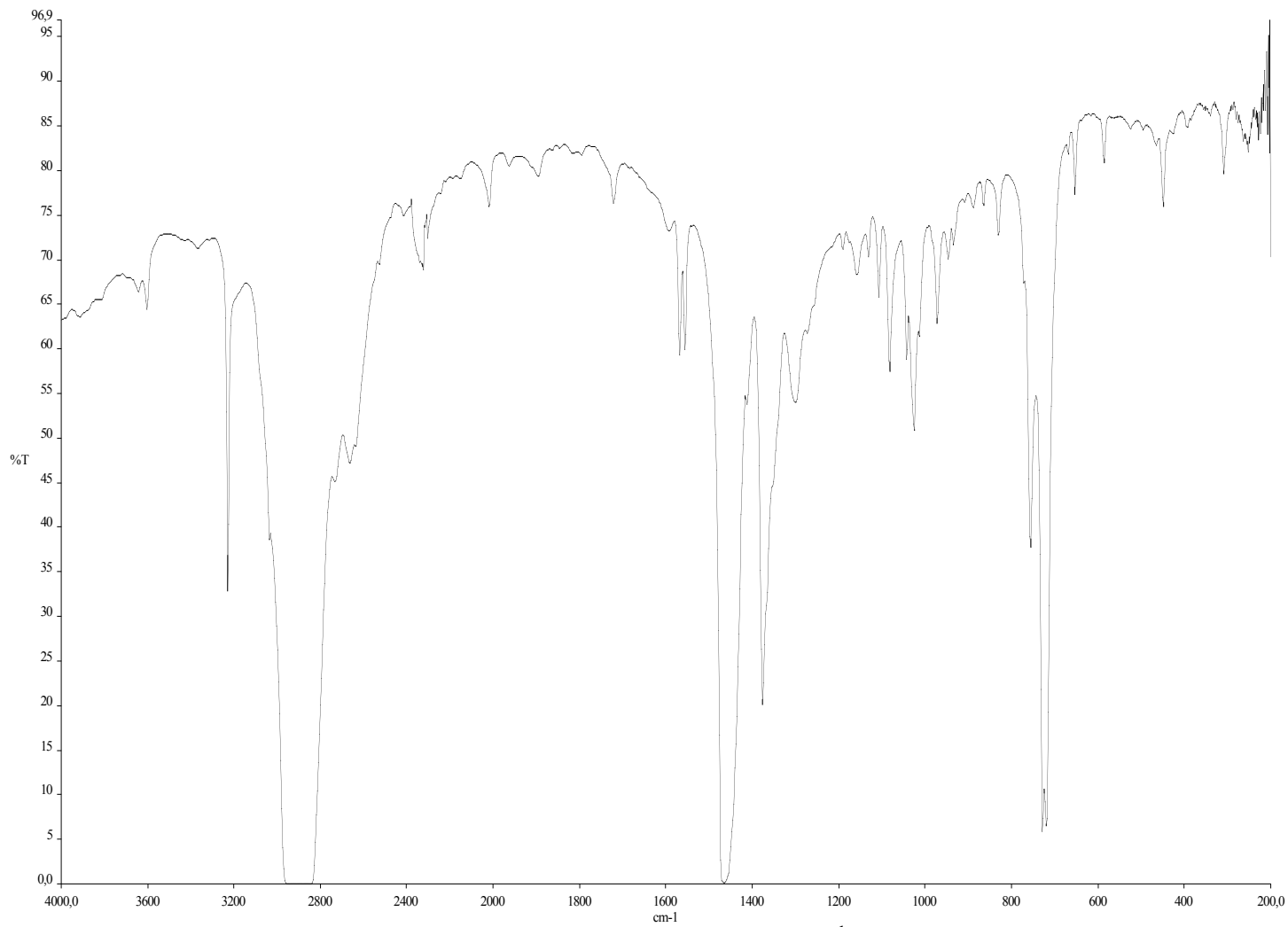
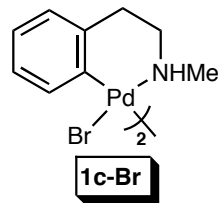
**IR spectrum of 1c-Cl (Nujol, cm<sup>-1</sup>)**



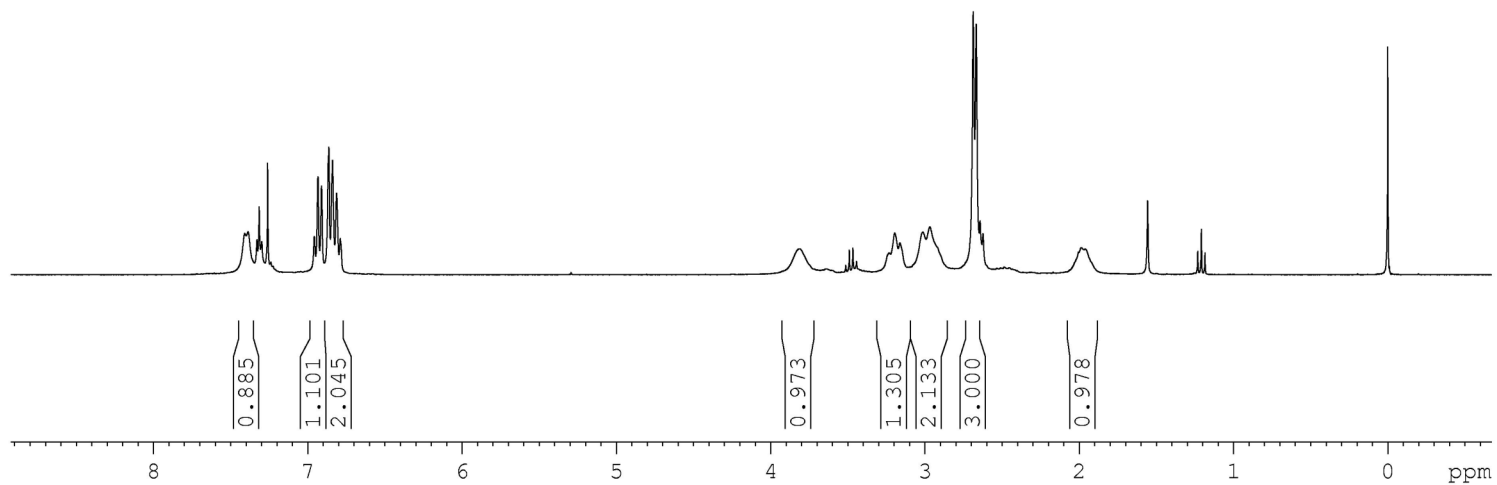
**<sup>1</sup>H NMR spectrum of 1c-Cl (DMSO-*d*<sub>6</sub>, 25 °C)**



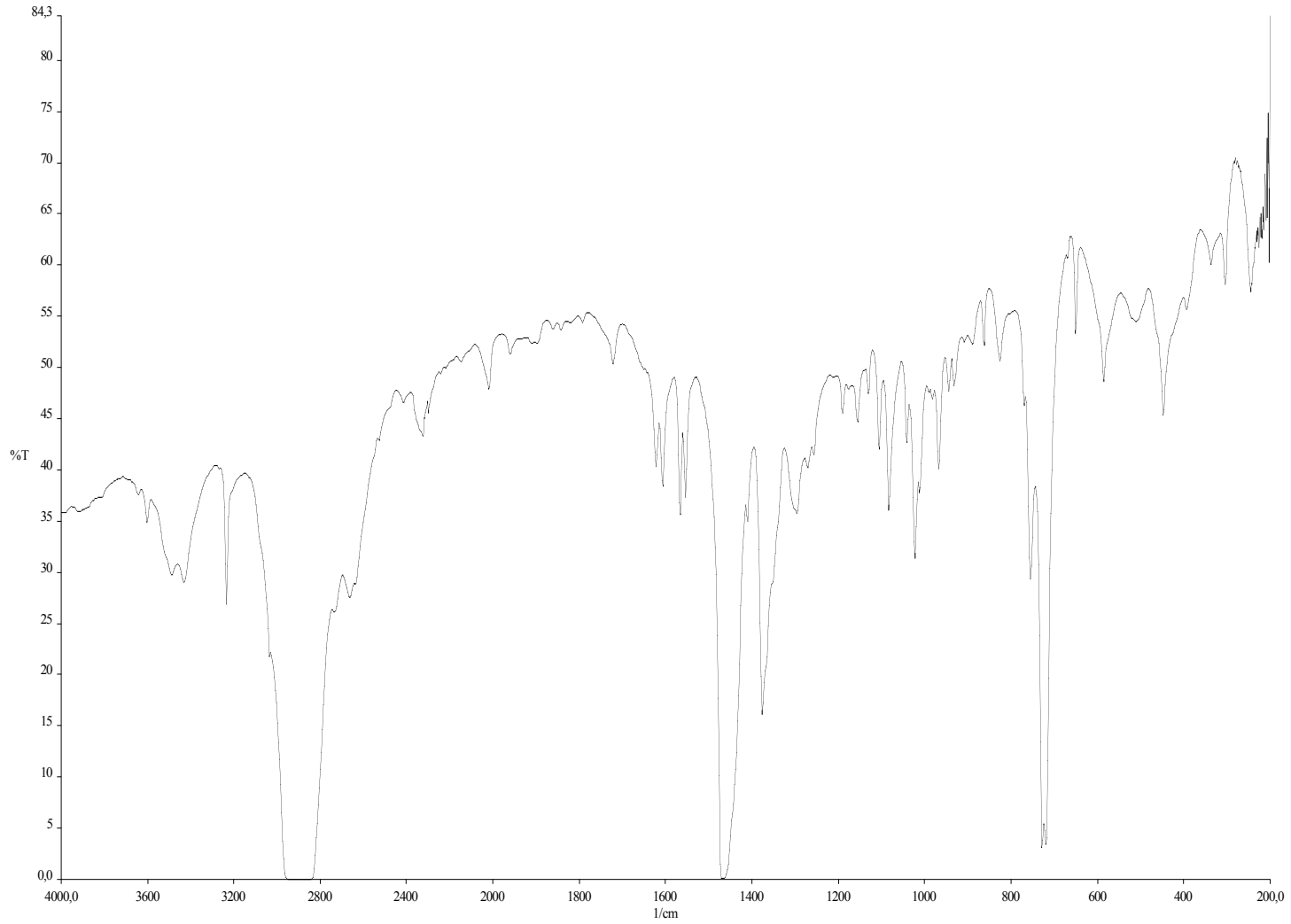
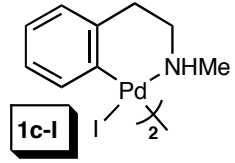
$^{13}\text{C}$  APT NMR spectrum of 1c-Cl (DMSO- $d_6$ , 25 °C)



**IR spectrum of 1c-Br (Nujol, cm<sup>-1</sup>)**

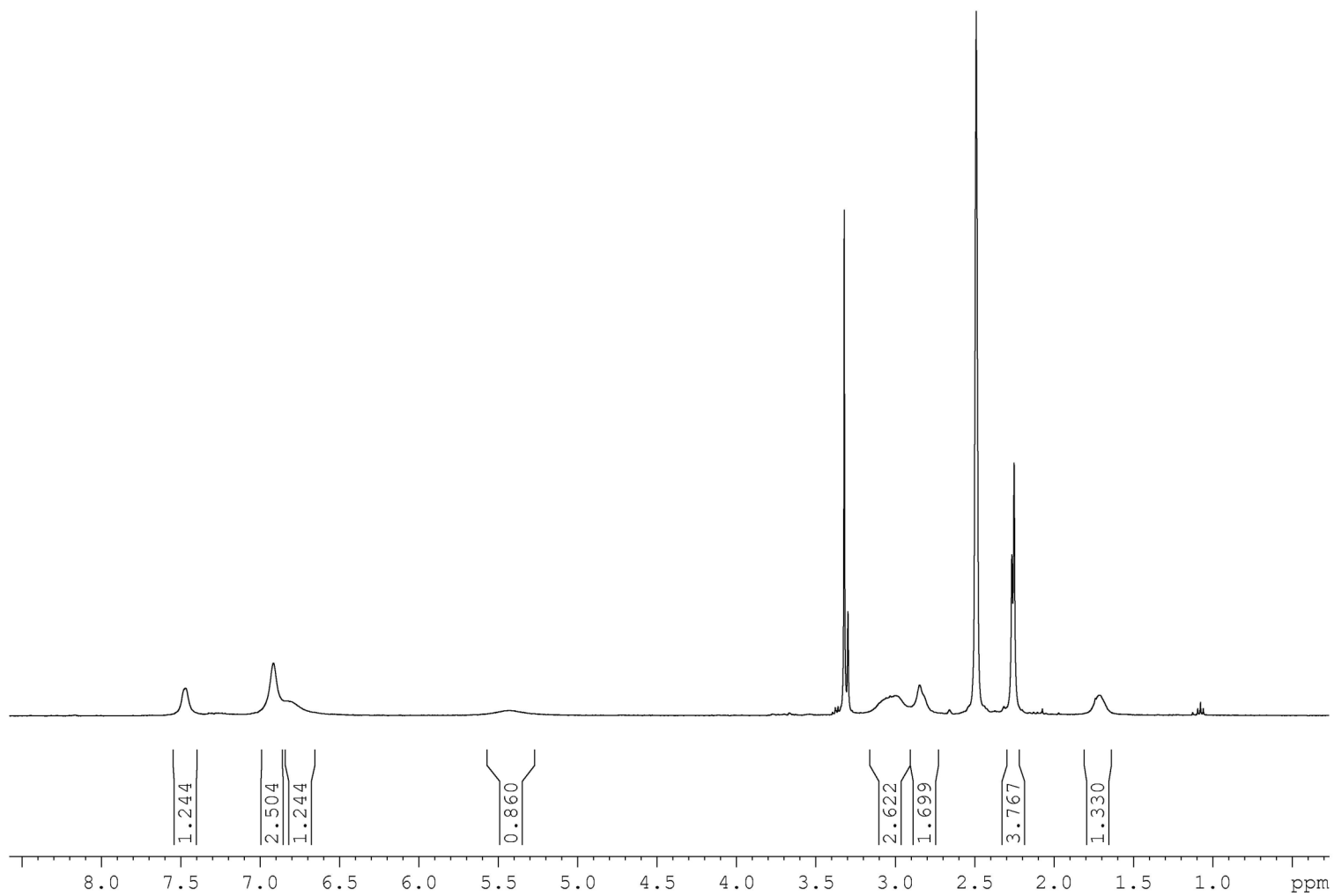


$^1\text{H}$  NMR spectrum of 1c-Br ( $\text{CDCl}_3 + \text{TMS}$ , 25 °C)

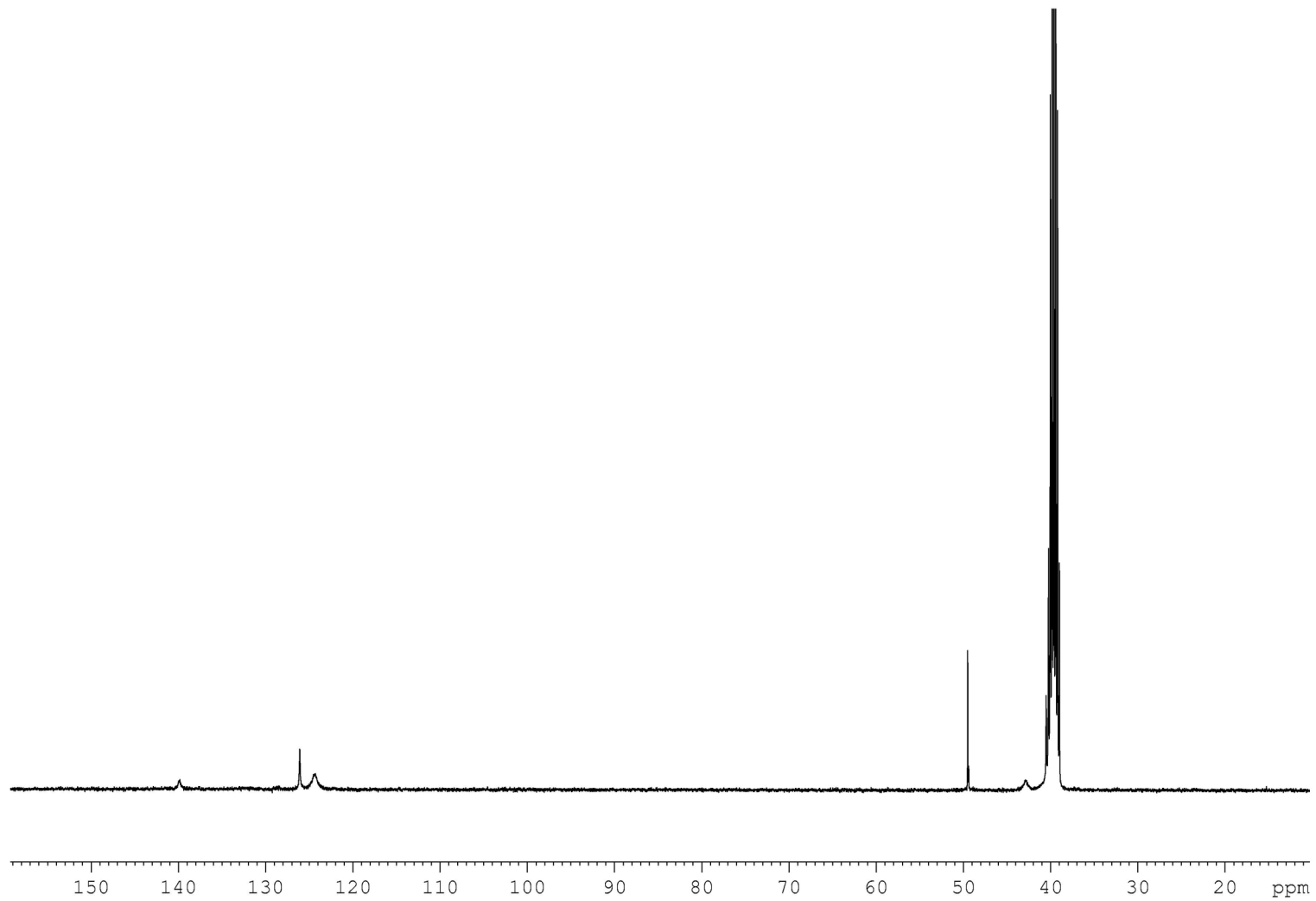


**IR spectrum of 1c-I (Nujol, cm<sup>-1</sup>)**

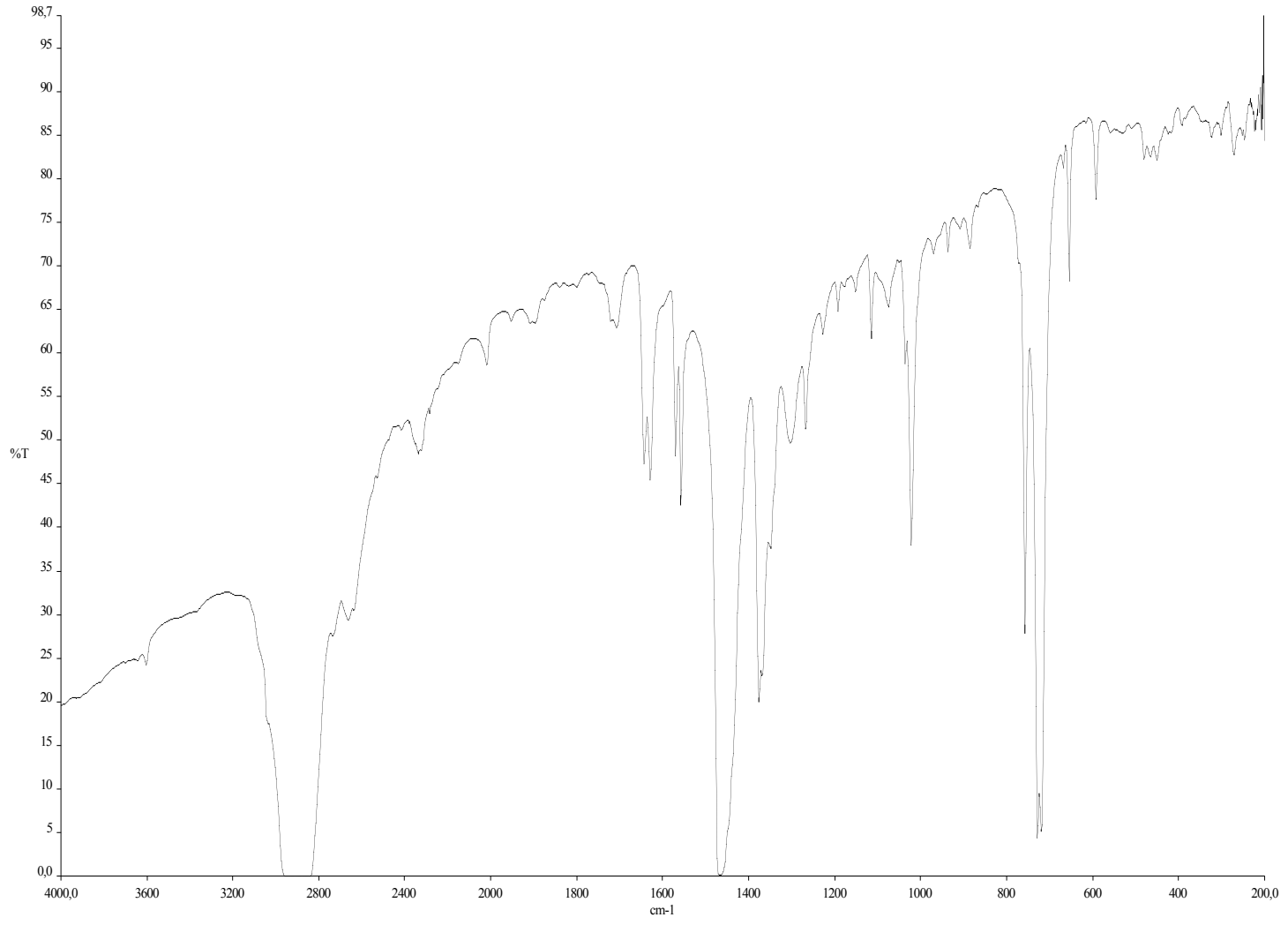
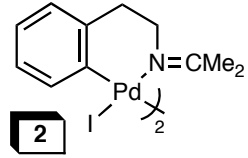




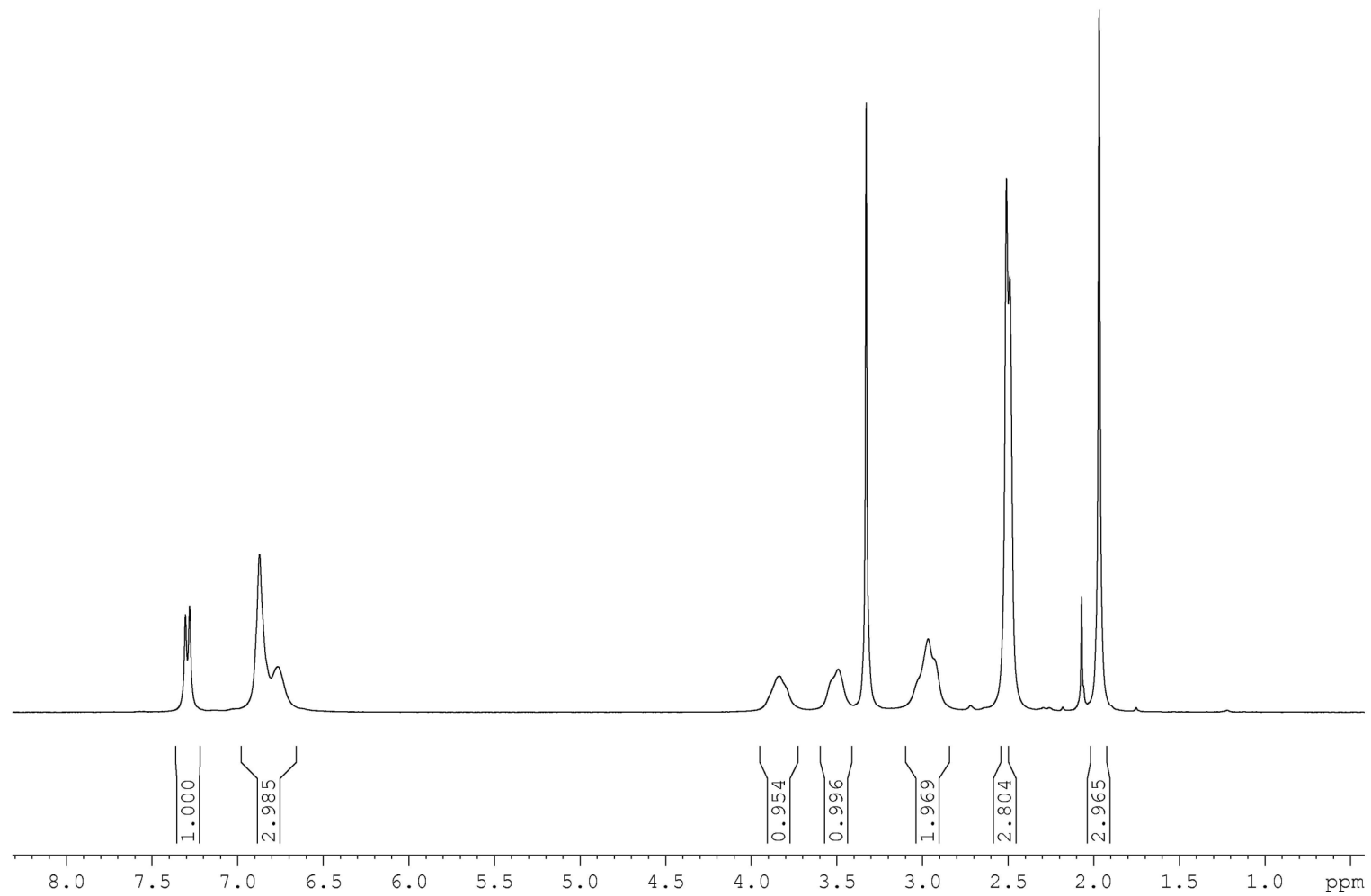
$^1\text{H}$  NMR spectrum of 1c-I ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



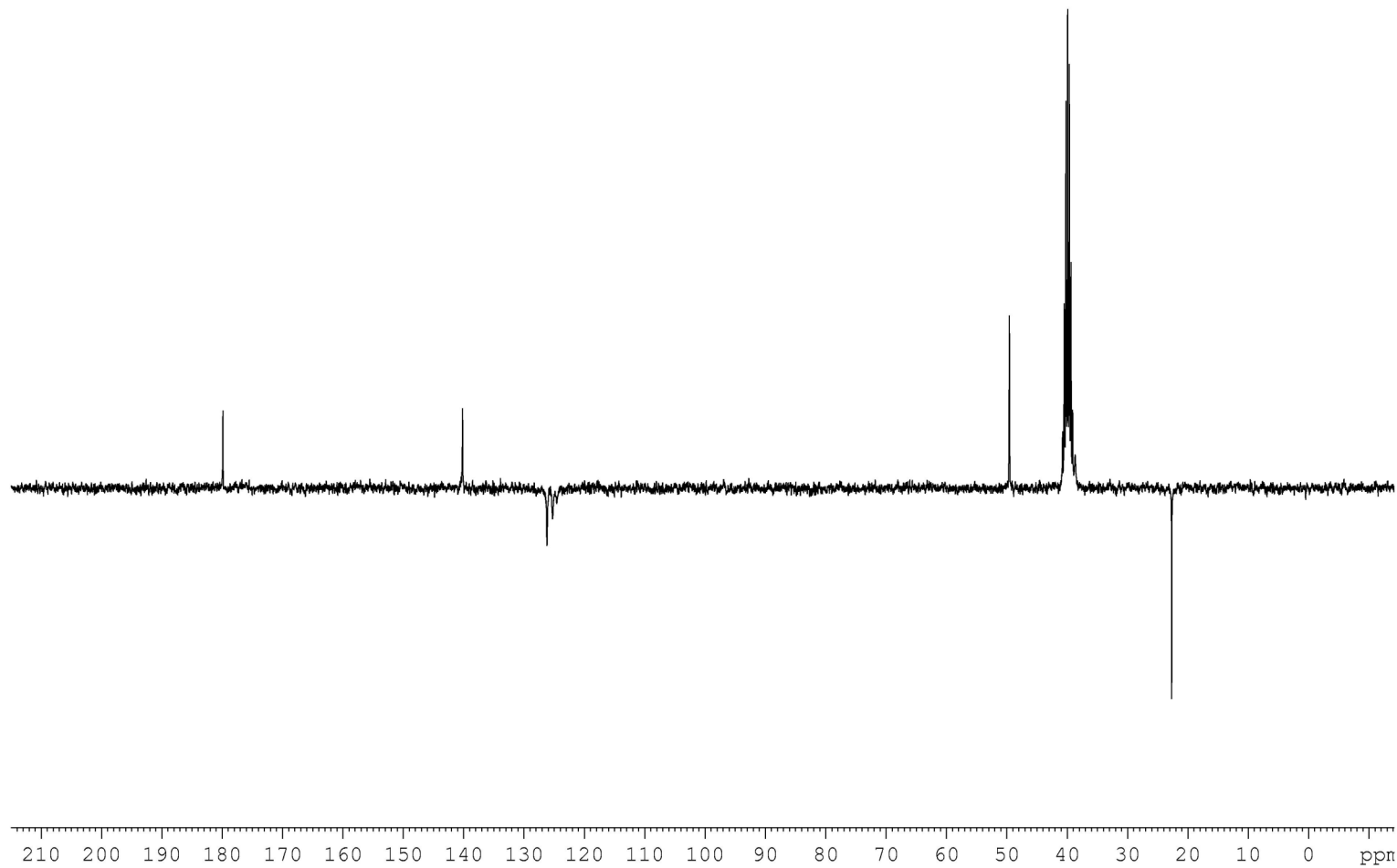
$^{13}\text{C}$  NMR spectrum of 1c-I (DMSO- $d_6$ , 25 °C)



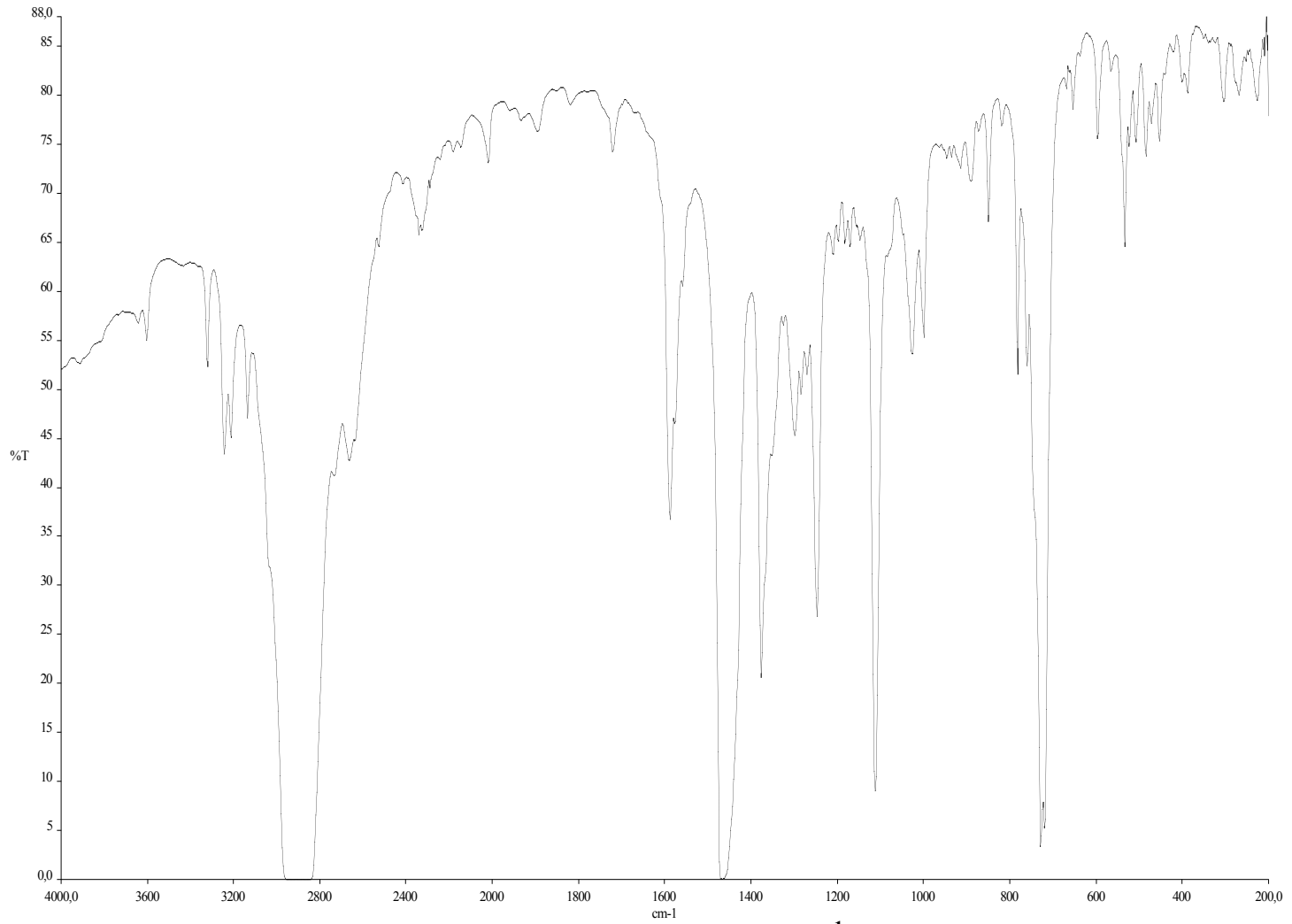
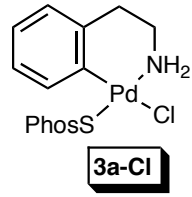
IR spectrum of 2 (Nujol, cm<sup>-1</sup>)



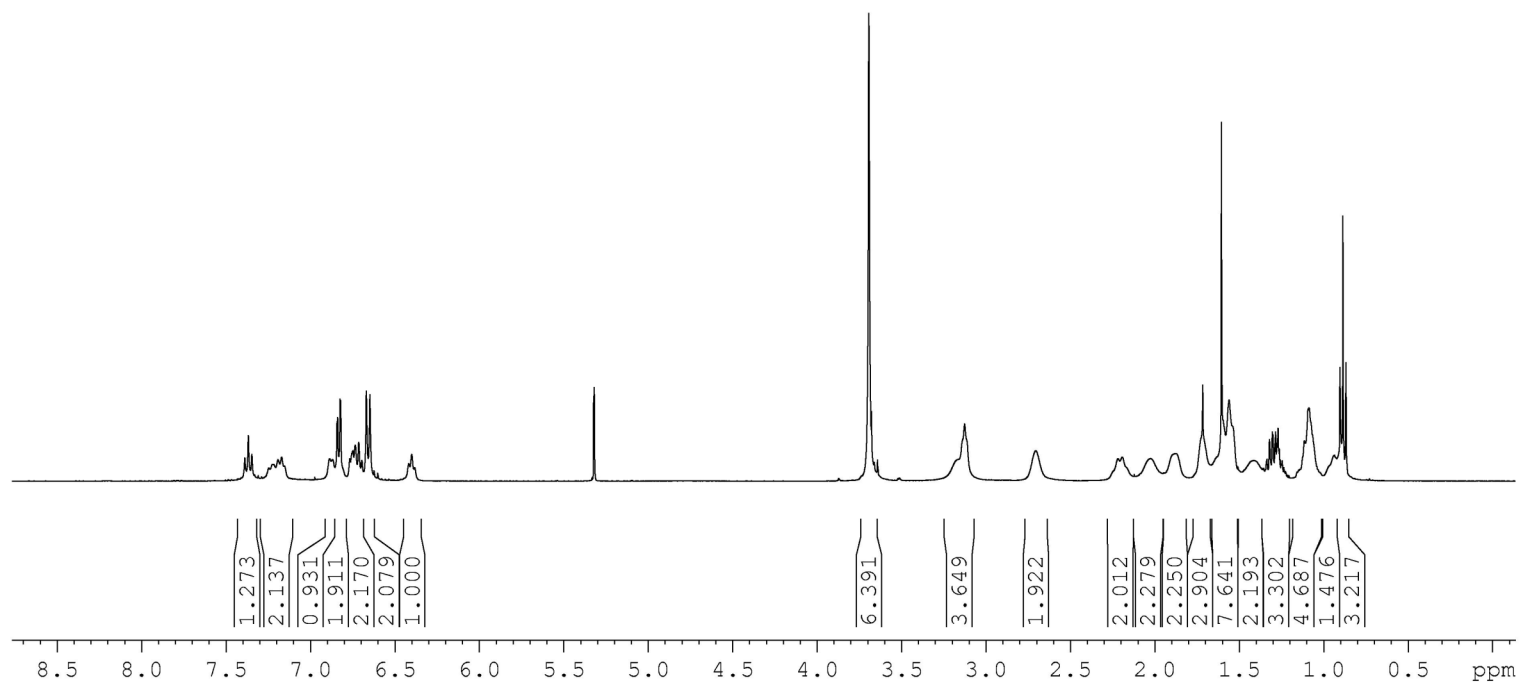
$^1\text{H}$  NMR spectrum of 2 ( $\text{DMSO-}d_6$ ,  $25\text{ }^\circ\text{C}$ )



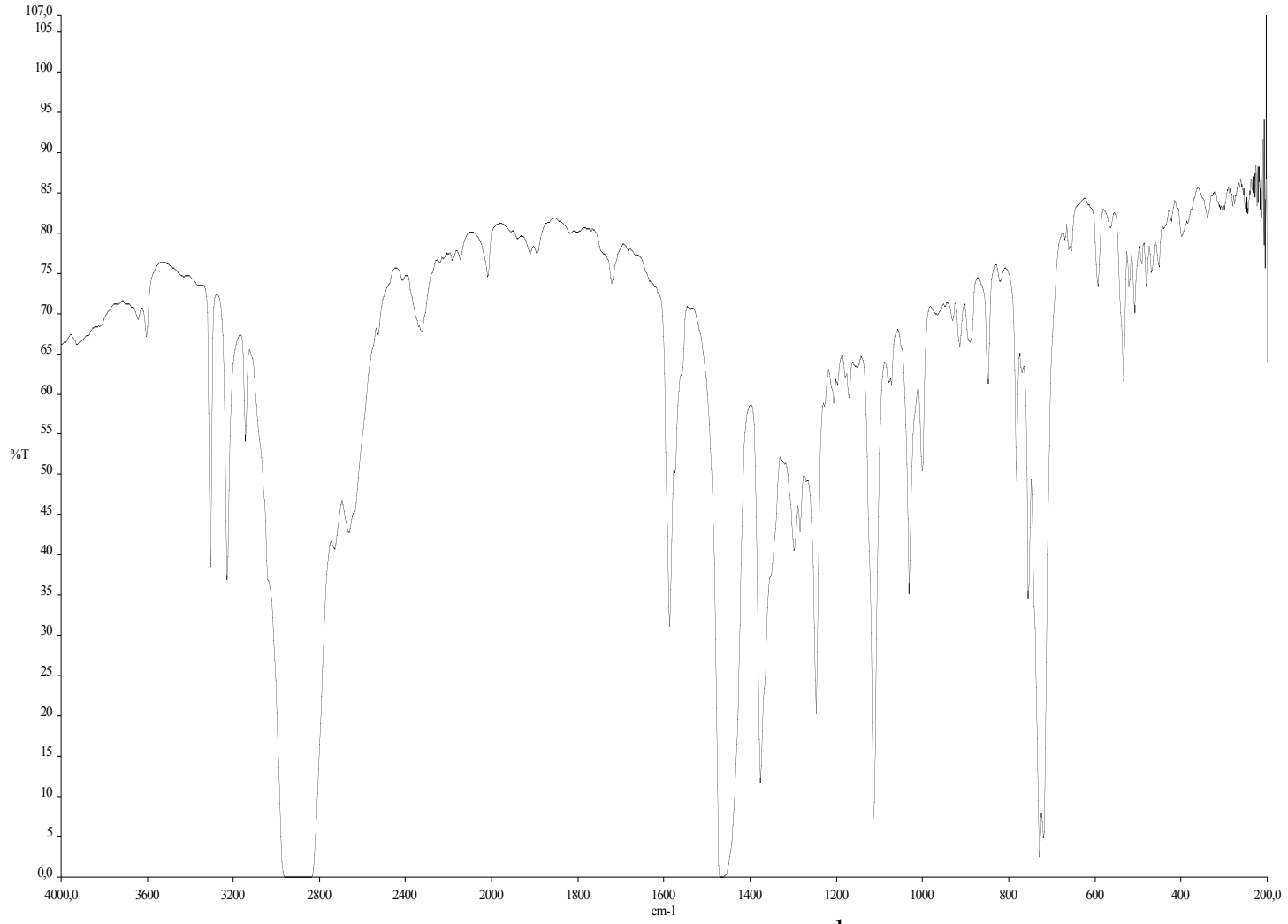
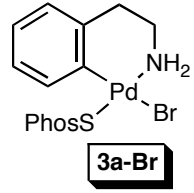
$^{13}\text{C}$  APT NMR spectrum of **2** (DMSO- $d_6$ , 25 °C)



**IR spectrum of 3a-Cl (Nujol, cm<sup>-1</sup>)**

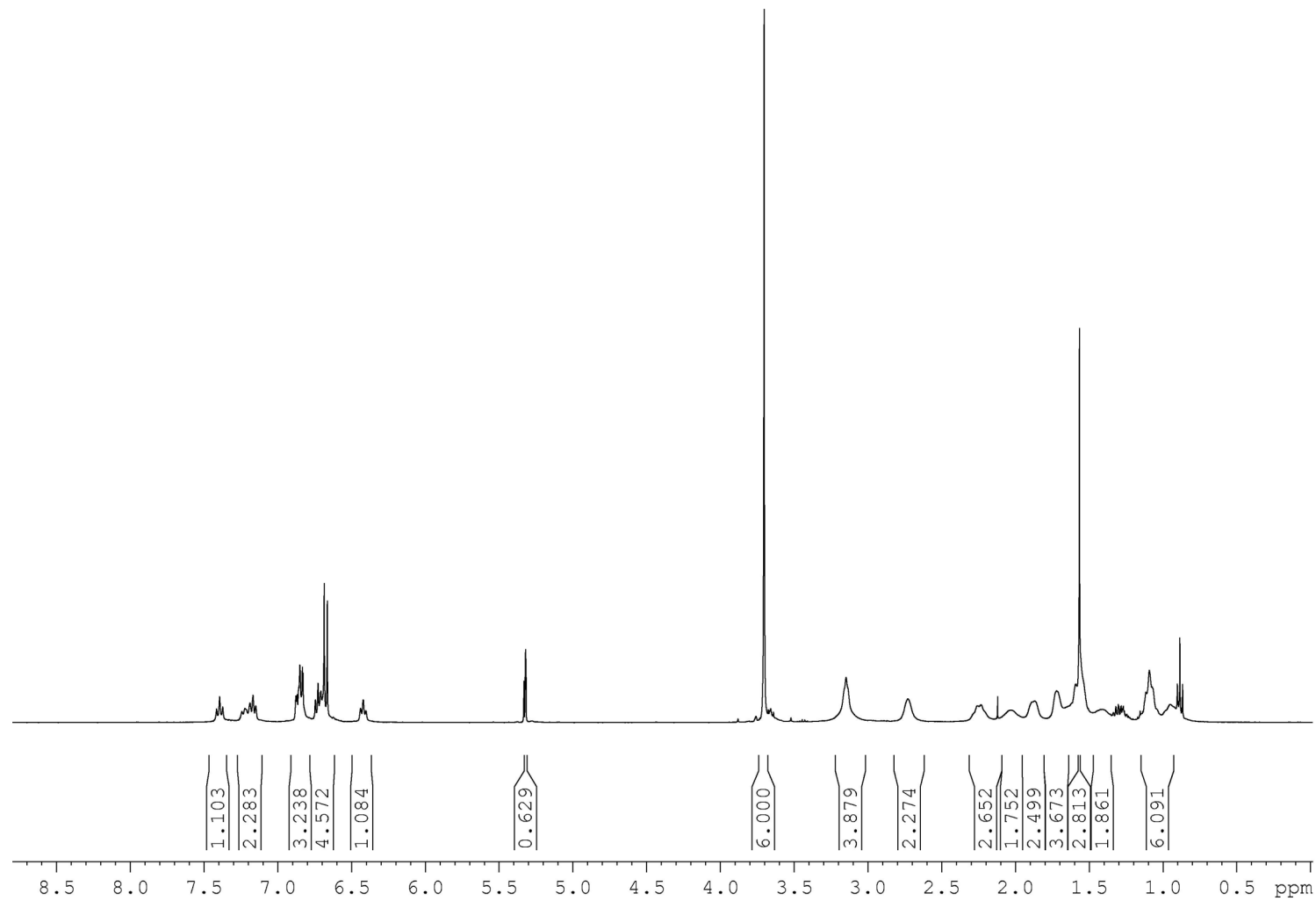


$^1\text{H}$  NMR spectrum of 3a-Cl ( $\text{CD}_2\text{Cl}_2$ ,  $25^\circ\text{C}$ )

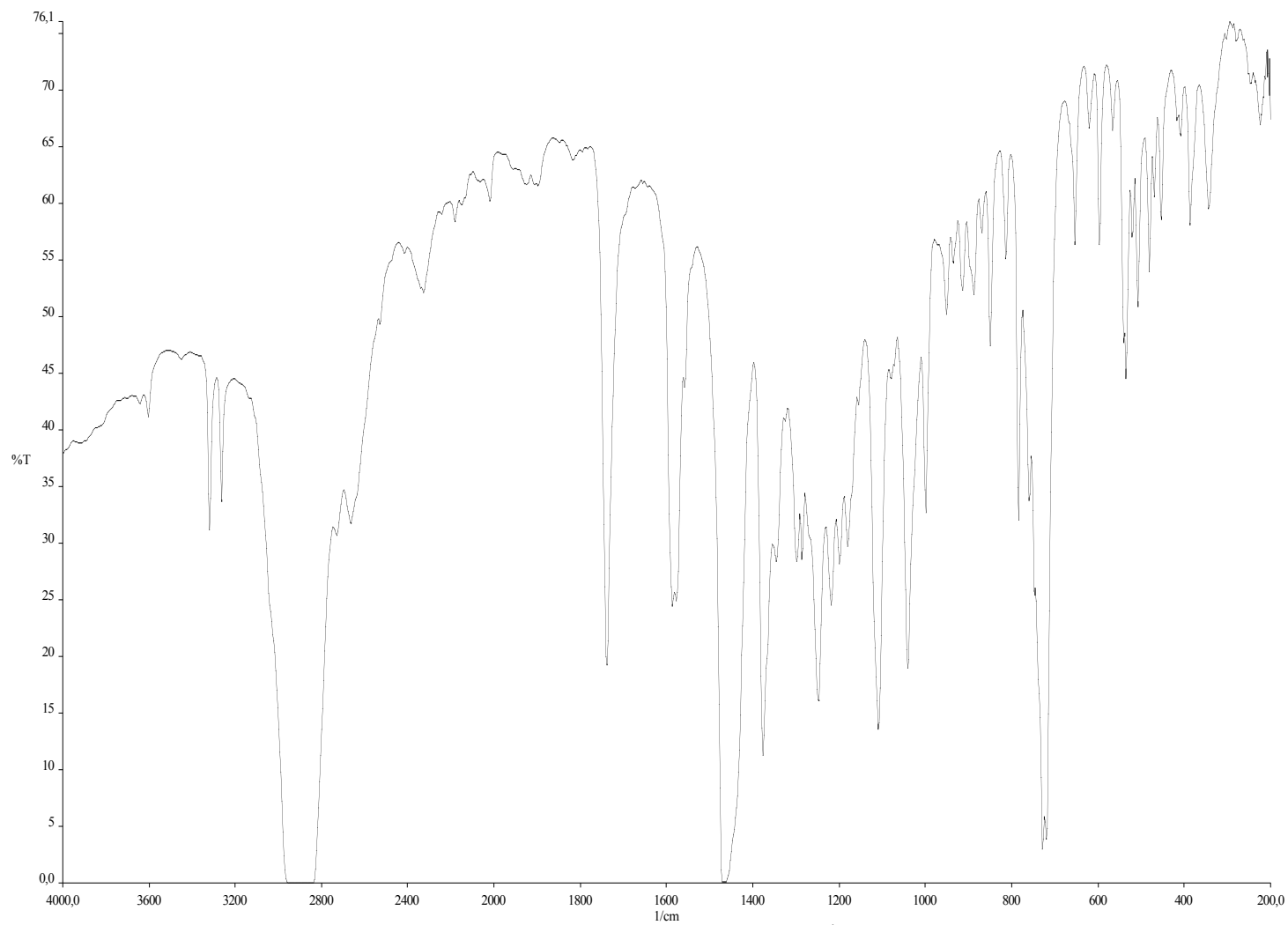
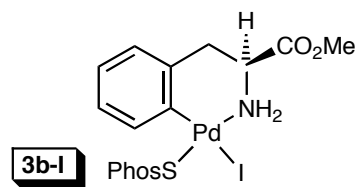


IR spectrum of 3a-Br (Nujol, cm<sup>-1</sup>)

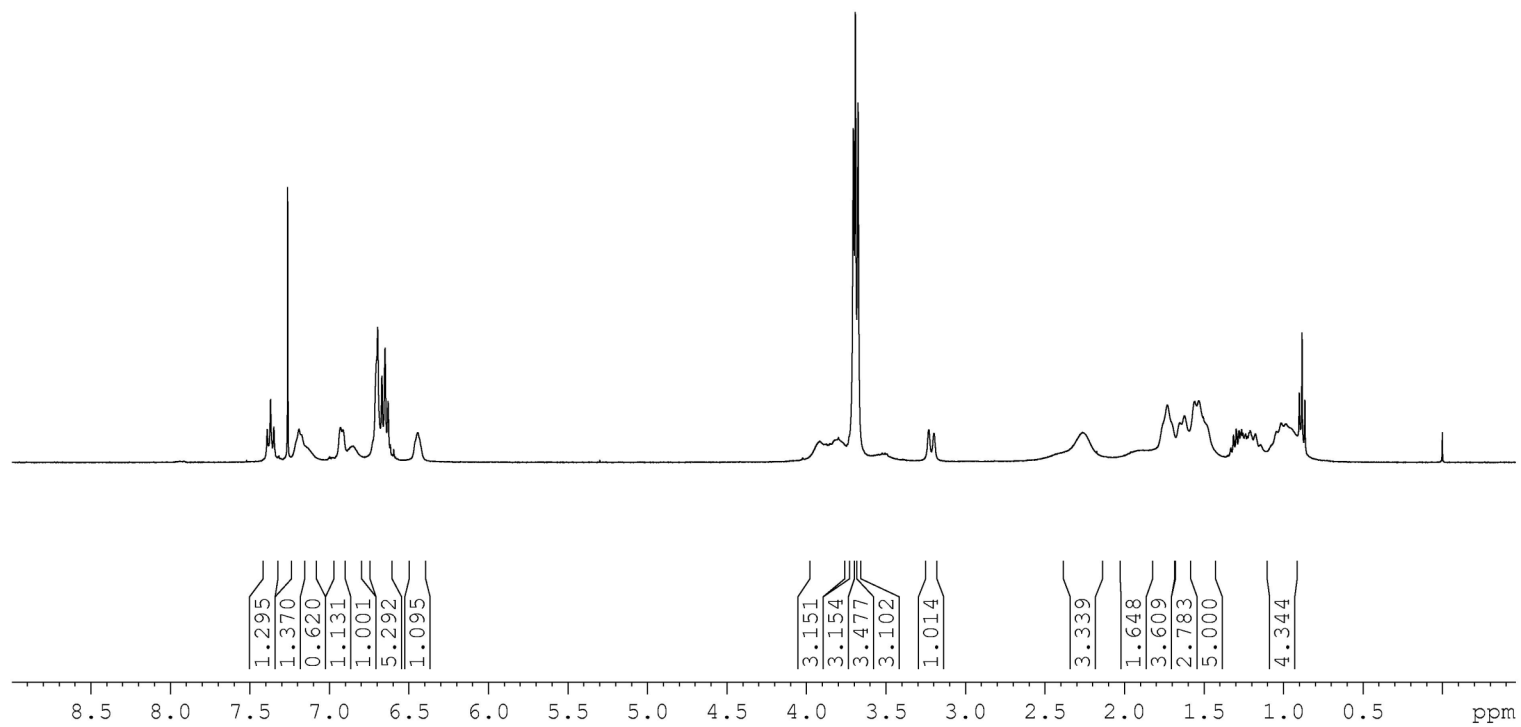




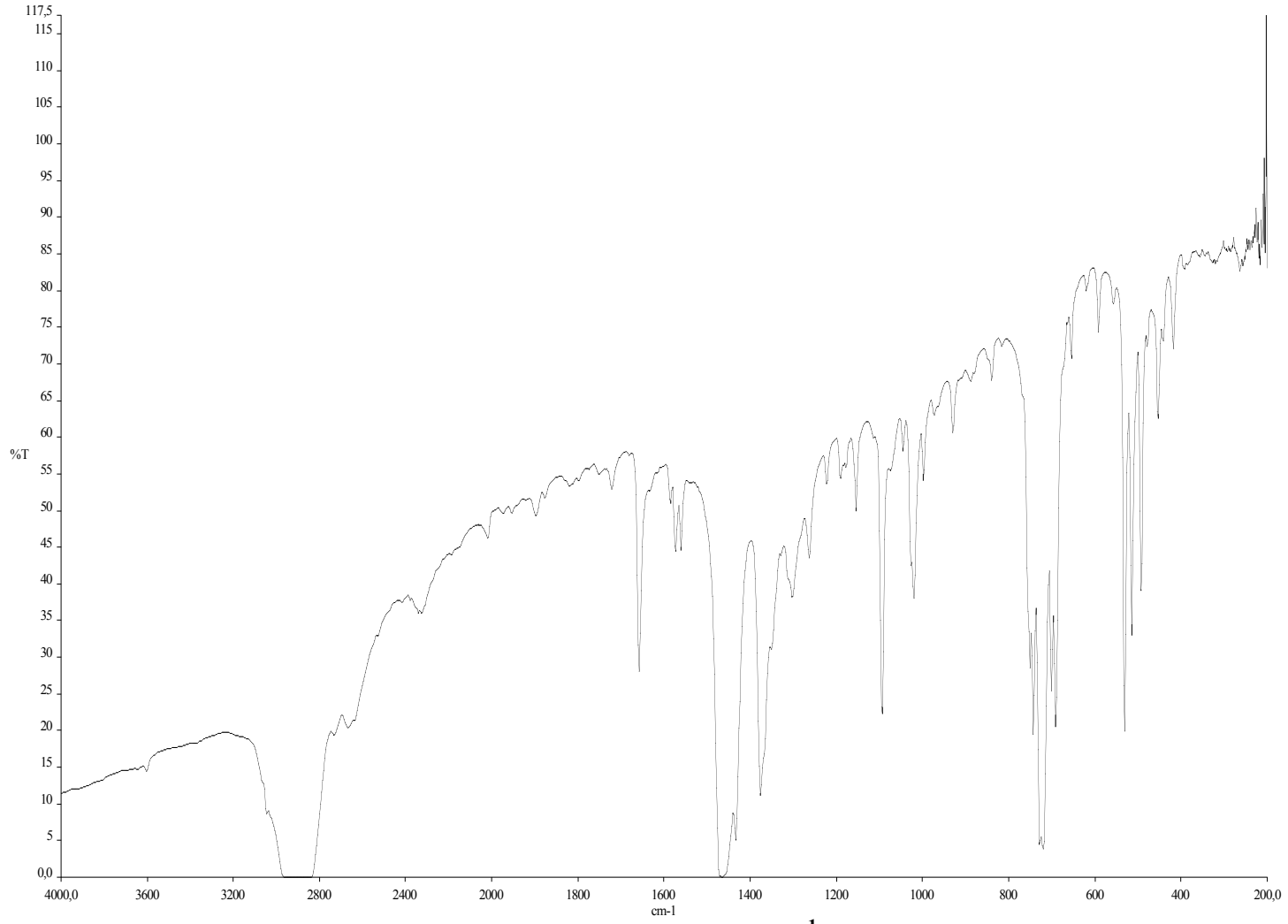
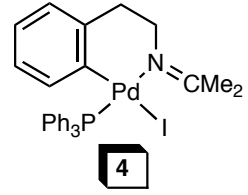
$^1\text{H}$  NMR spectrum of 3a-Br ( $\text{CD}_2\text{Cl}_2$ ,  $25\text{ }^\circ\text{C}$ )



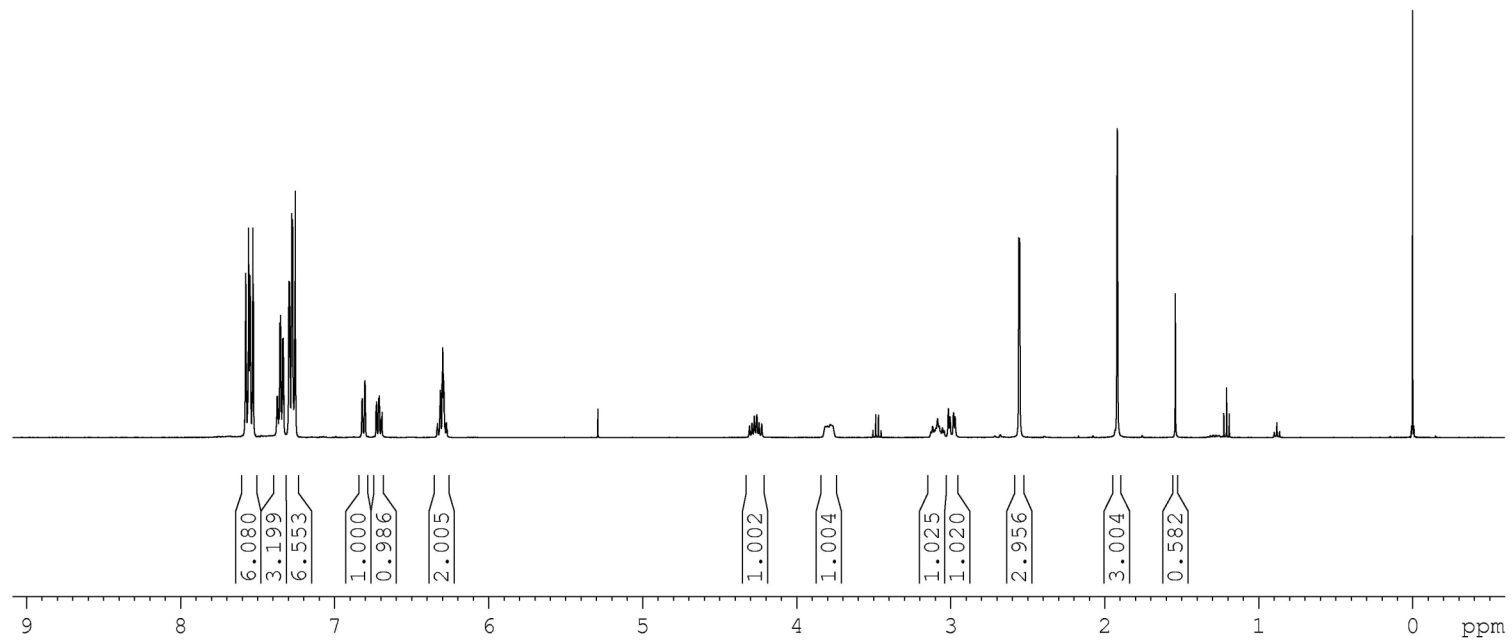
IR spectrum of **3b-I** (Nujol, cm<sup>-1</sup>)



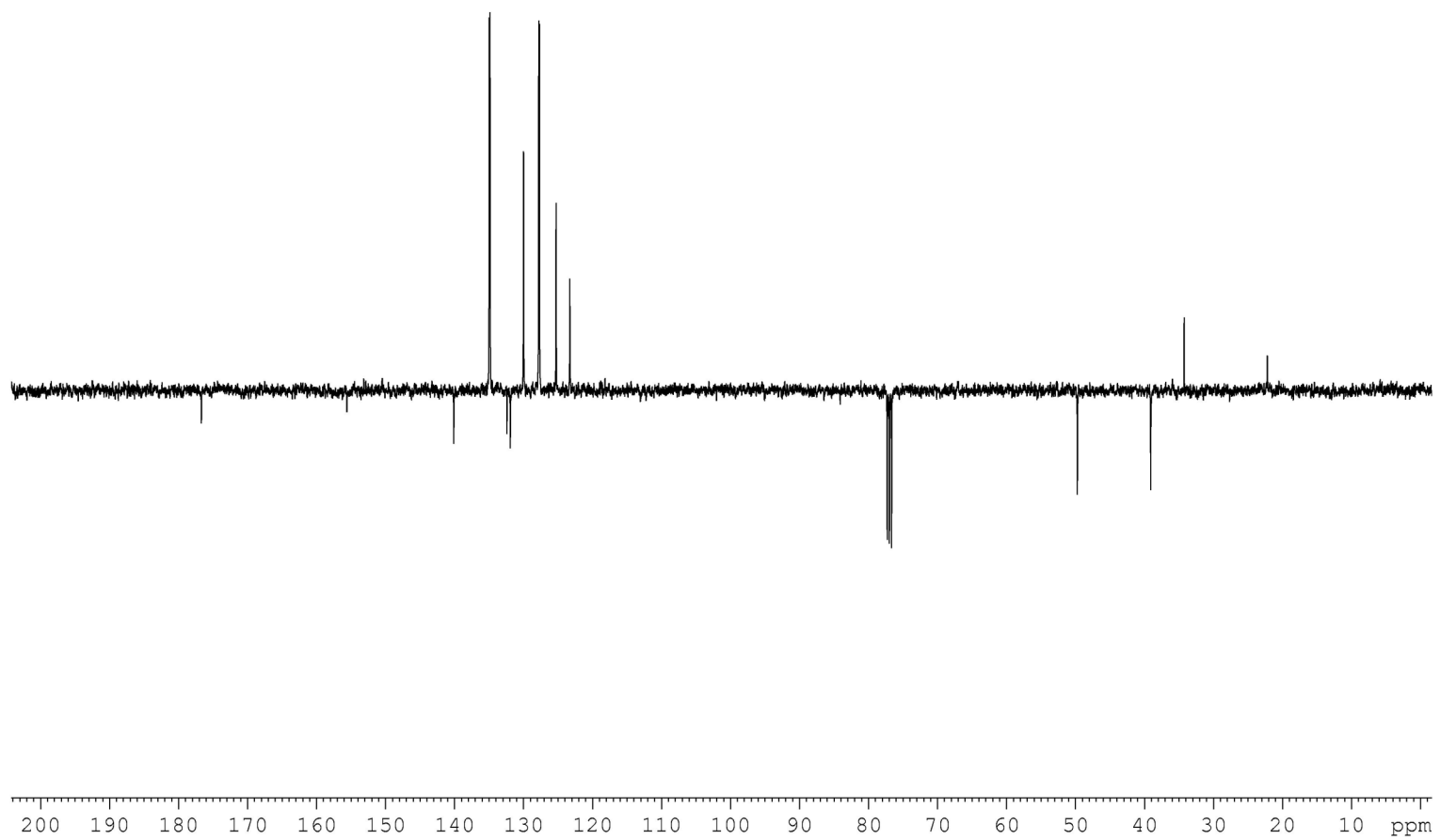
$^1\text{H}$  NMR spectrum of 3b-I ( $\text{CDCl}_3 + \text{TMS}$ , 25 °C)



IR spectrum of 4 (Nujol, cm<sup>-1</sup>)



$^1\text{H}$  NMR spectrum of 4 ( $\text{CDCl}_3 + \text{TMS}$ , 25 °C)



$^{13}\text{C}$  APT NMR spectrum of **4** (CDCl<sub>3</sub>+ TMS, 25 °C)