

## Supplementary Material

### Novel push-pull thieno[2,3-*b*]indole-based dyes for efficient dye-sensitized solar cells (DSSCs)

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<sup>c</sup> Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, 11999, Russia

<sup>d</sup> Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, 119071, Russia

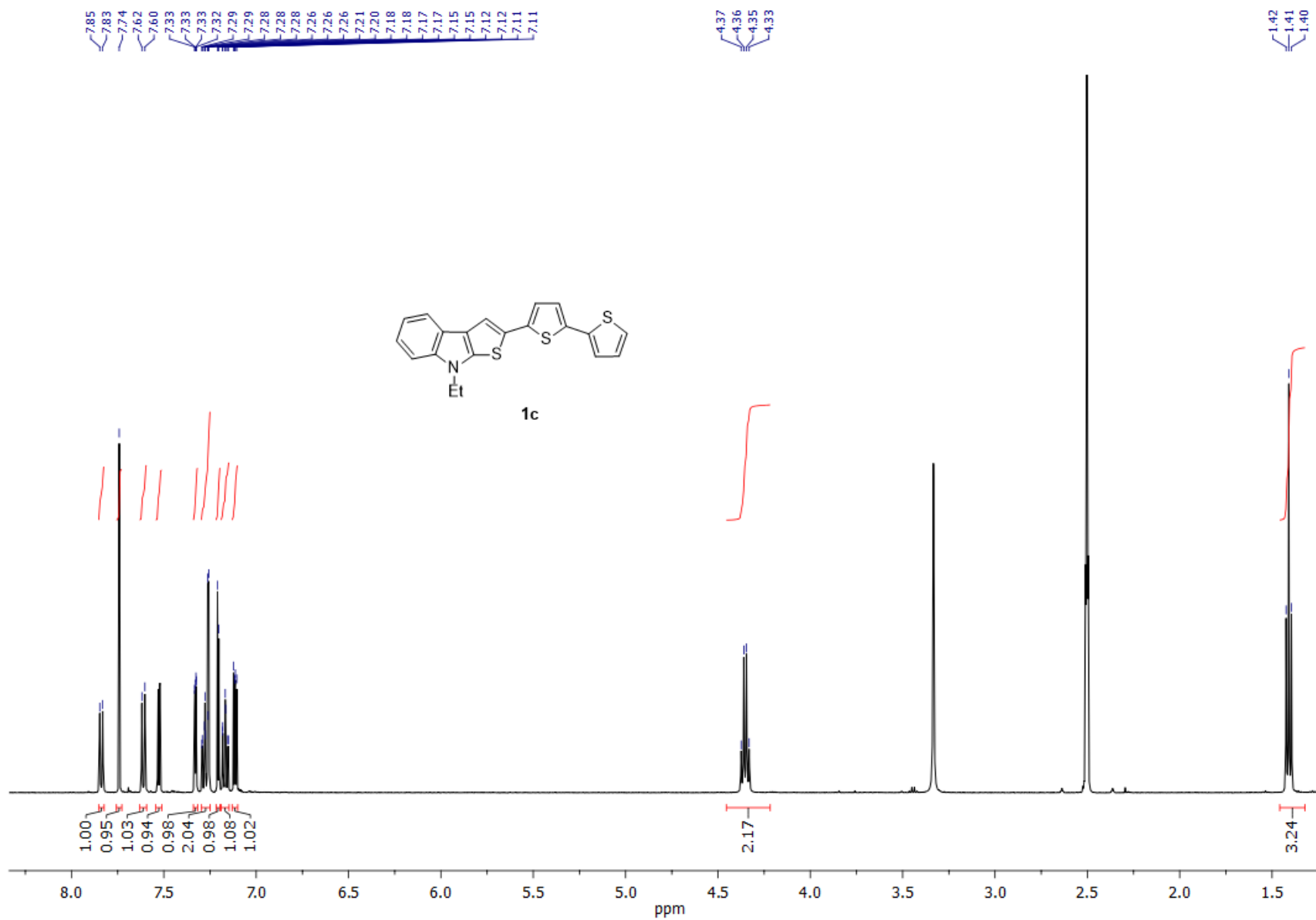
<sup>e</sup> Department of Chemistry, National Research Tomsk State University, Tomsk, 634050, Russia

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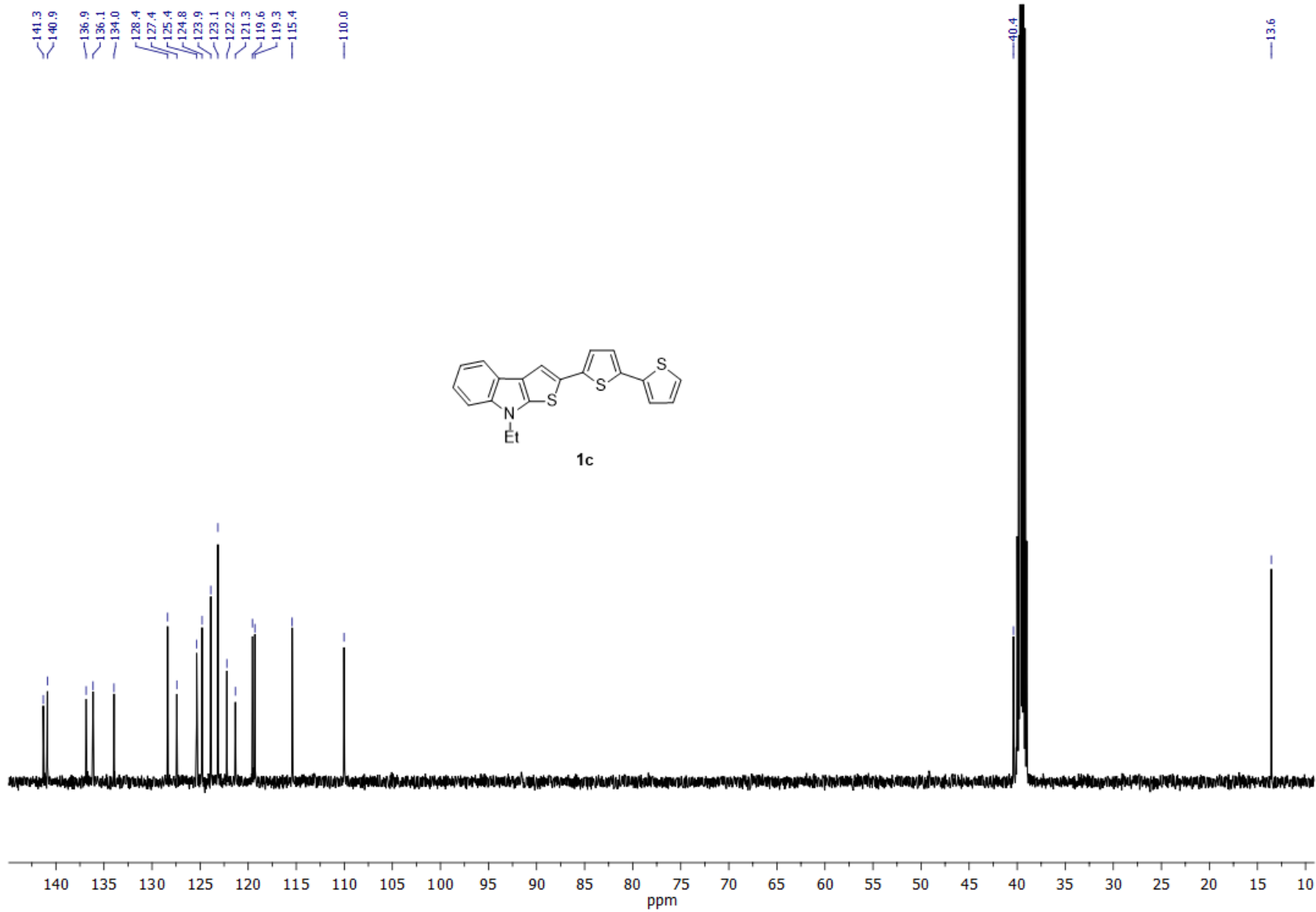
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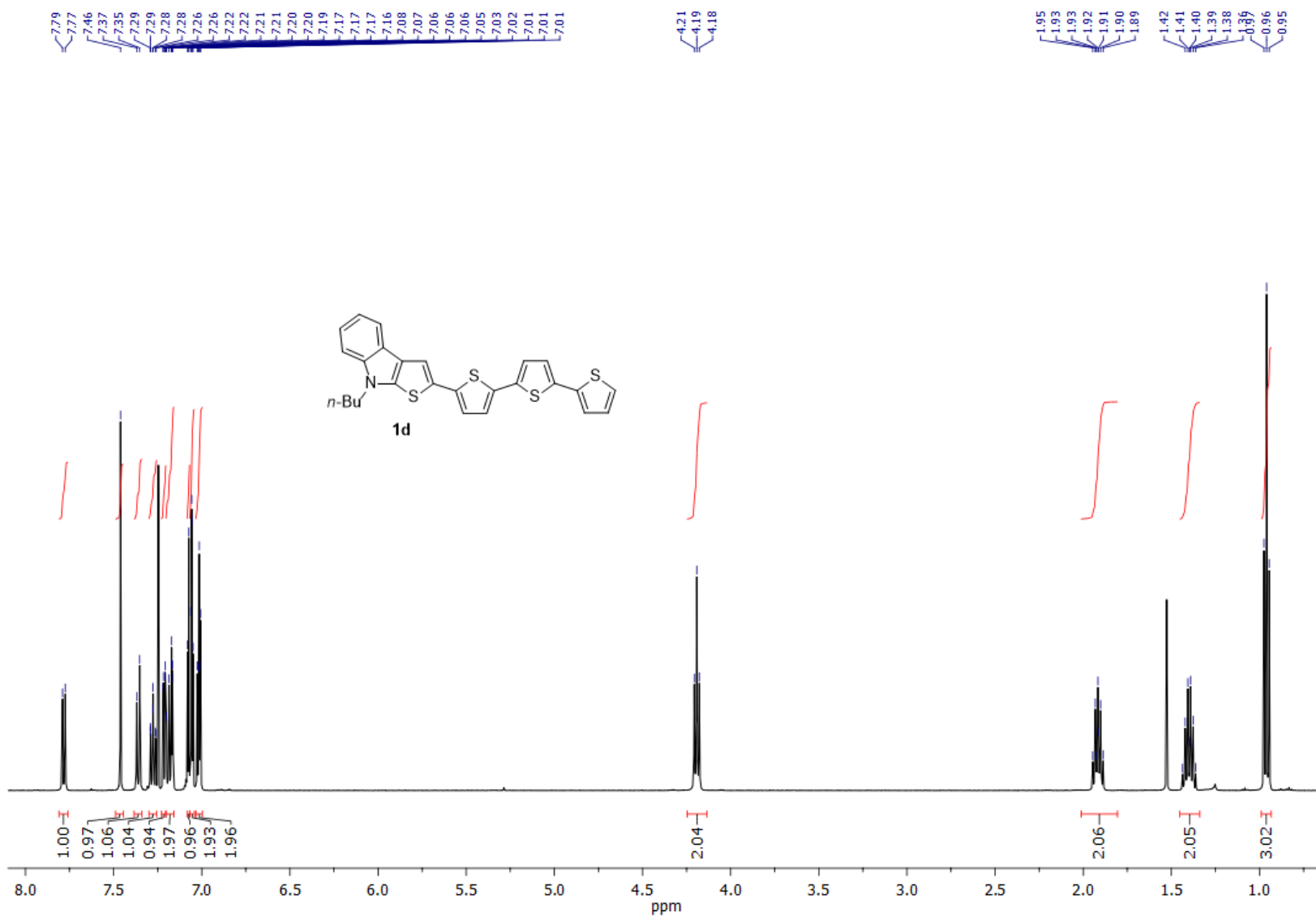
<sup>1</sup>H NMR (solvent: DMSO-d<sub>6</sub>)



S2

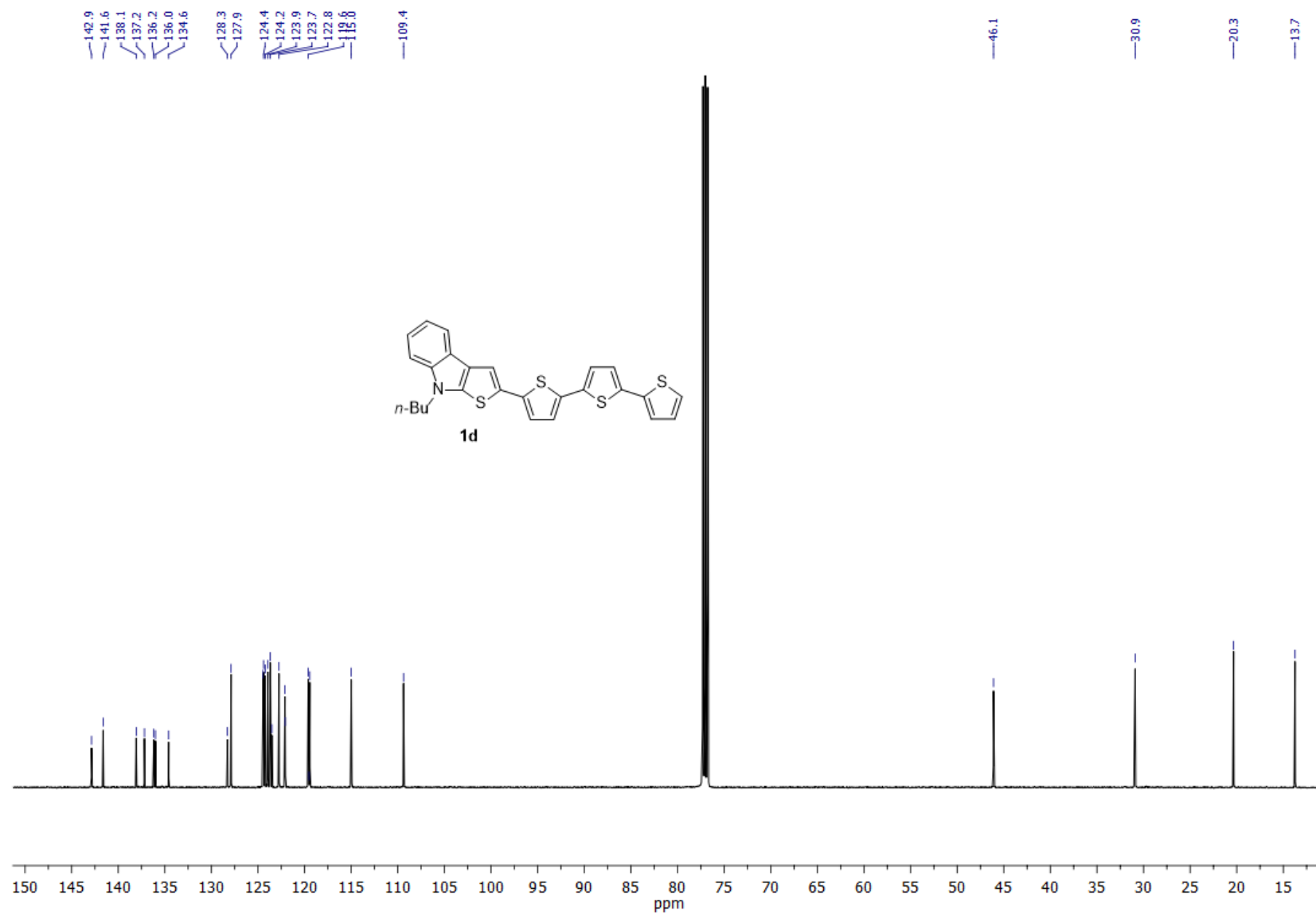
$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S3

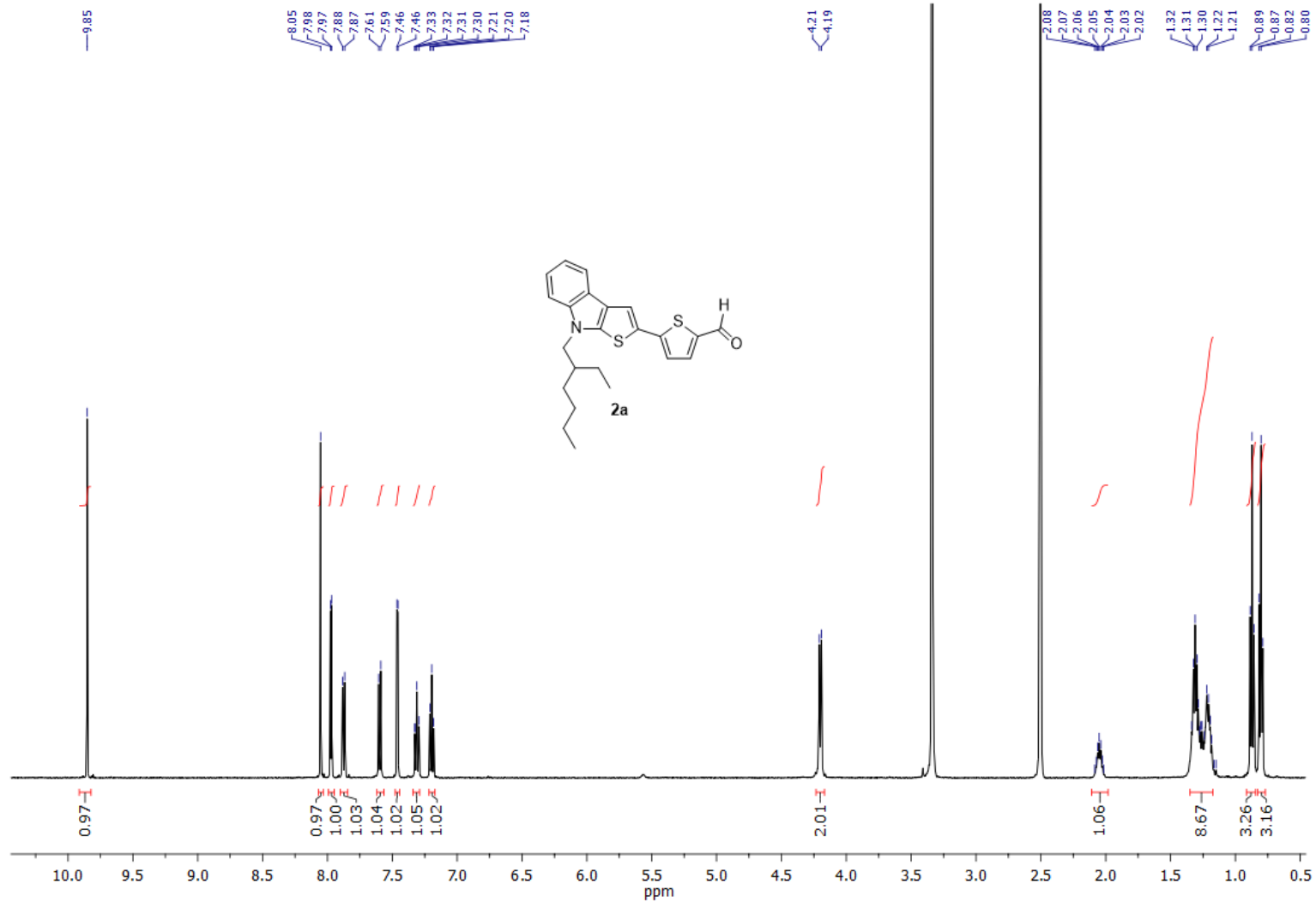


**<sup>1</sup>H NMR (solvent: CDCl<sub>3</sub>)**

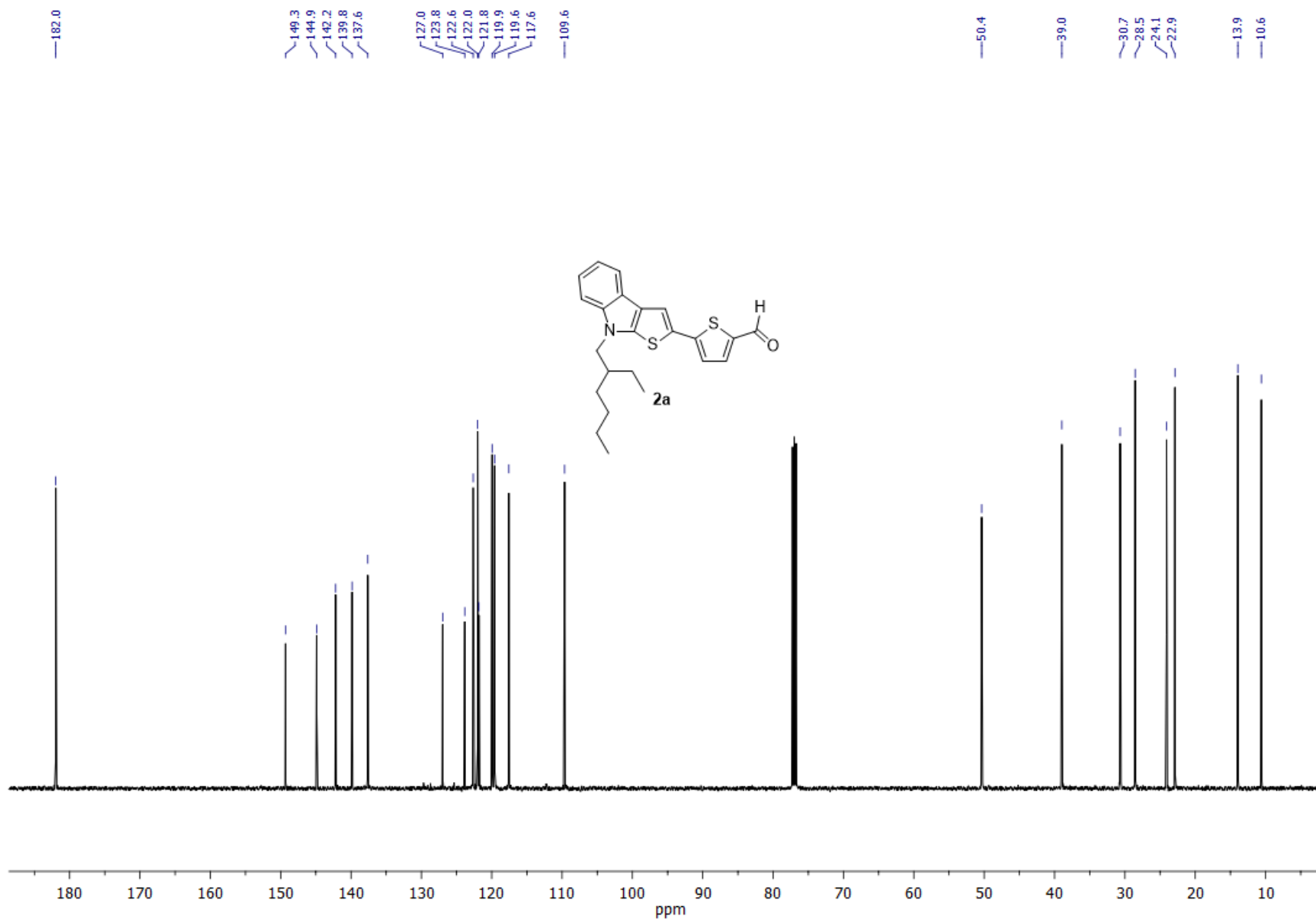
**S4**

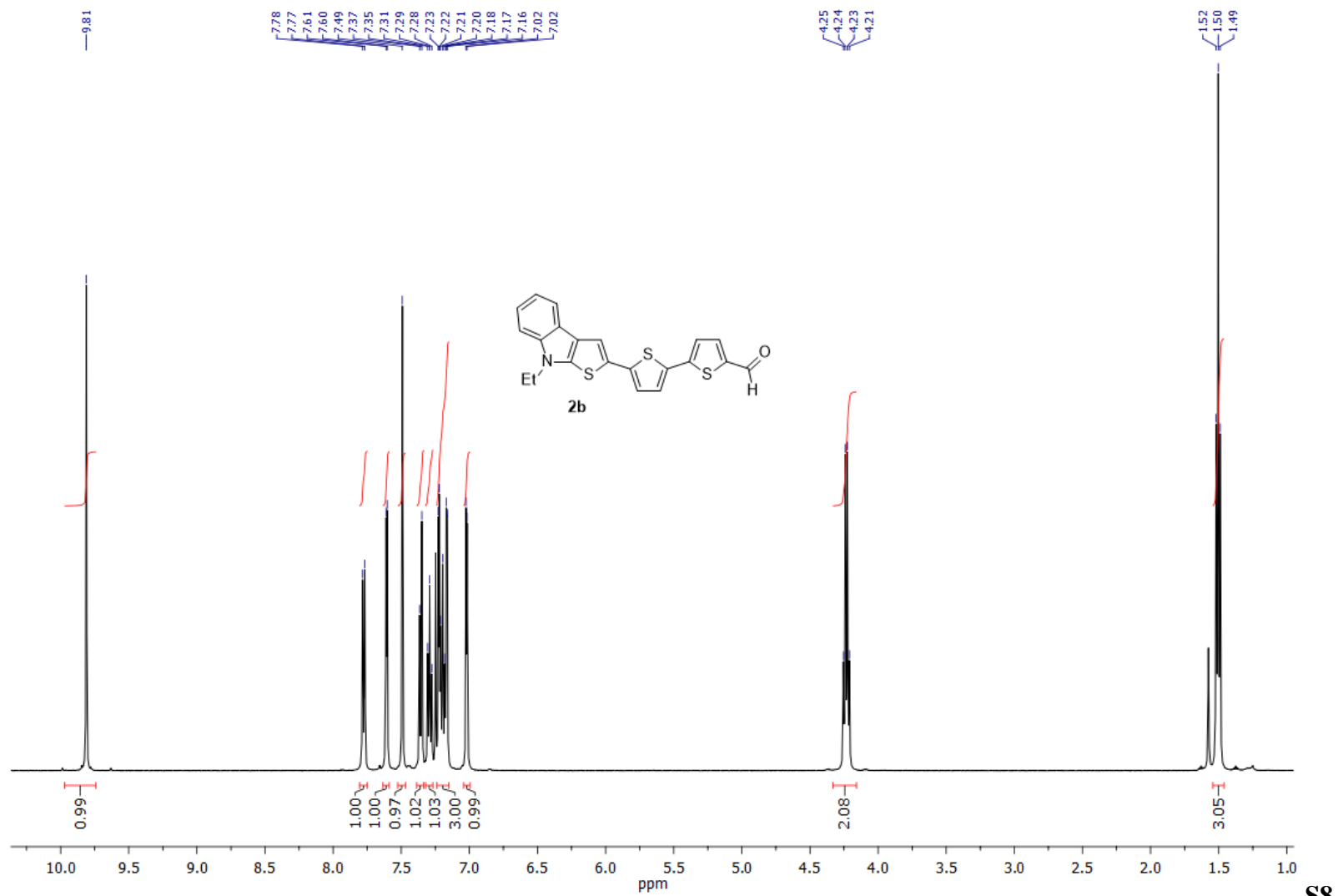
$^{13}\text{C}$  NMR (solvent:  $\text{CDCl}_3$ )

S5

$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

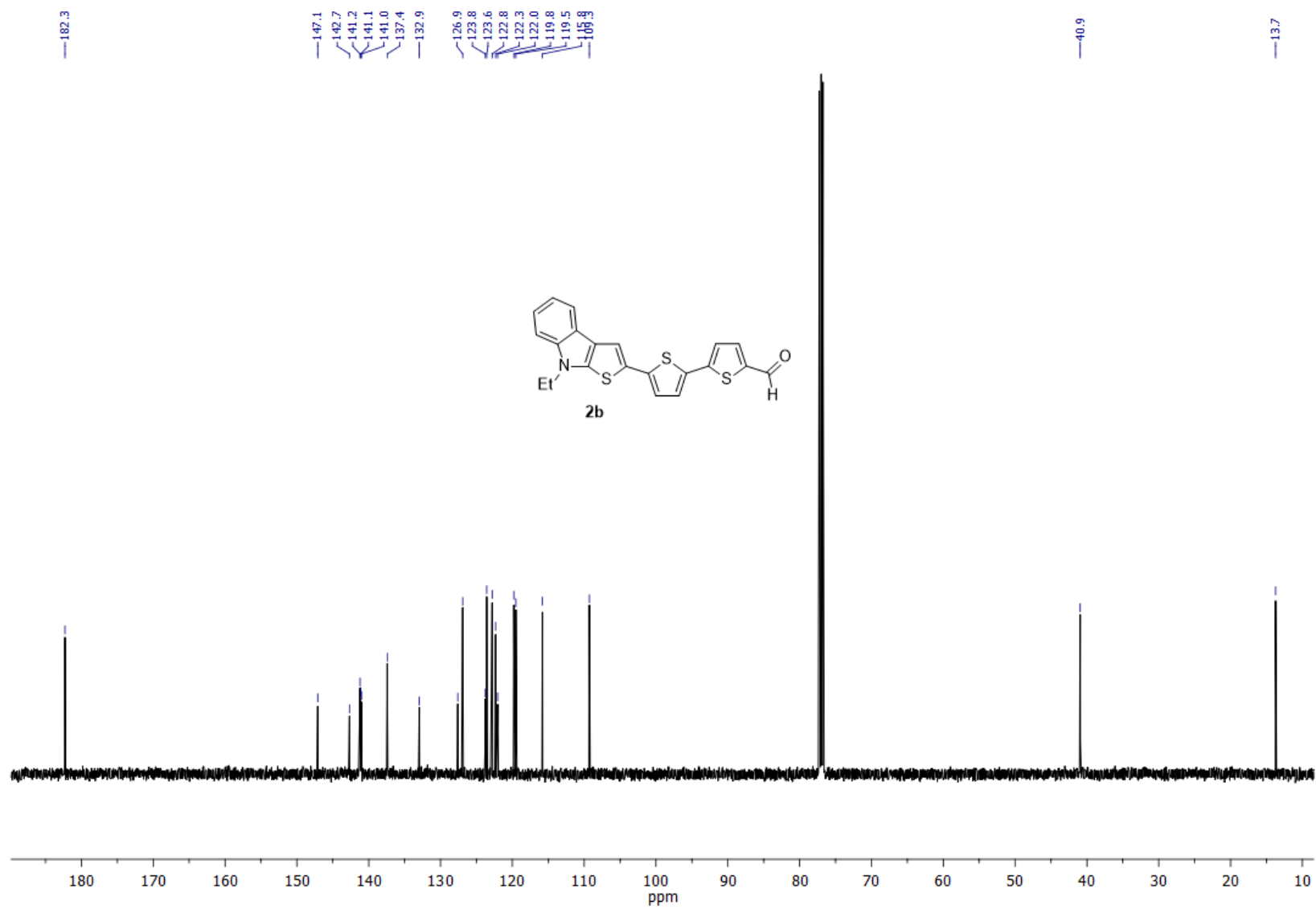
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$^{13}\text{C}$  NMR (solvent:  $\text{CDCl}_3$ )

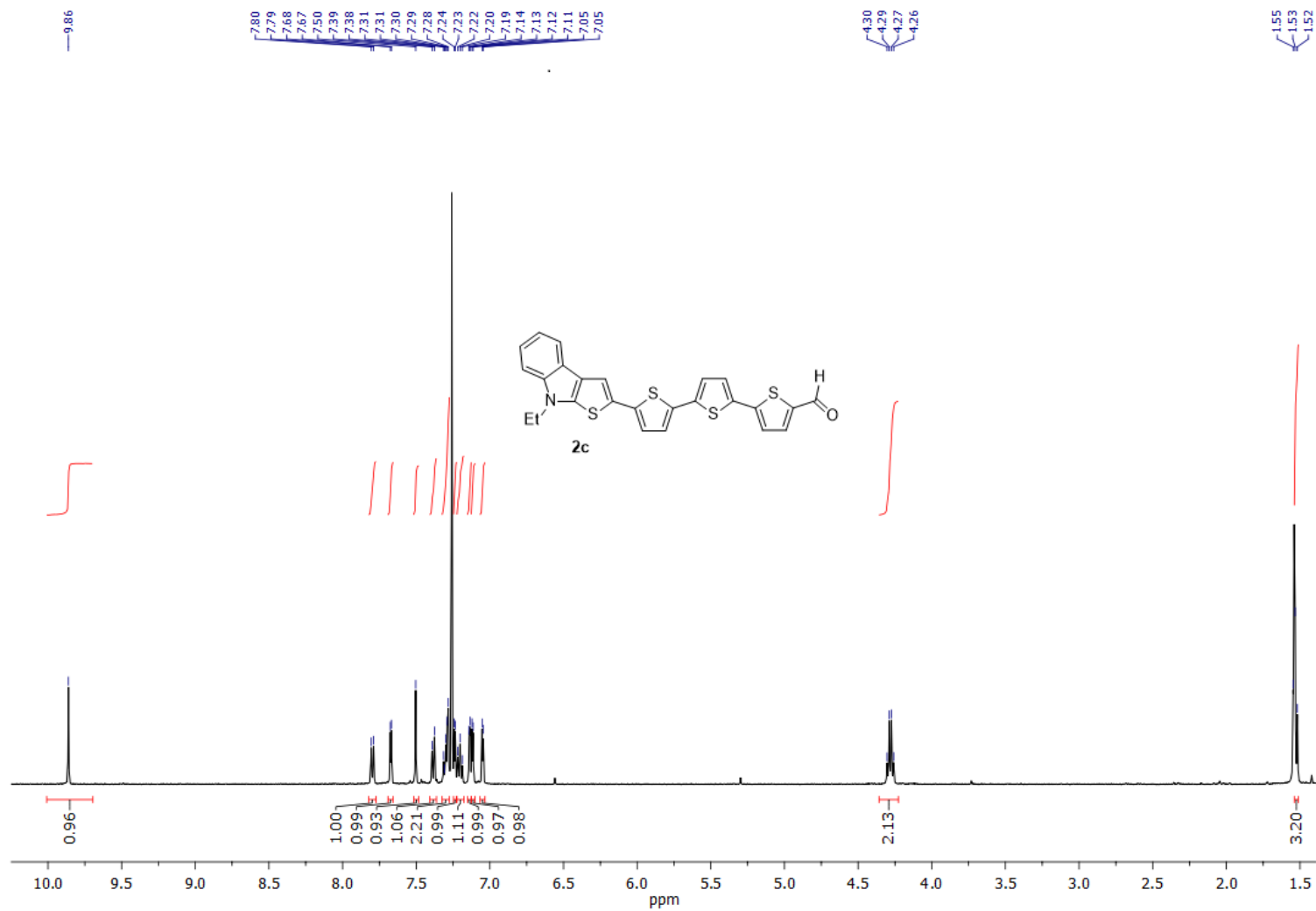
$^1\text{H}$  NMR (solvent:  $\text{CDCl}_3$ )

S8

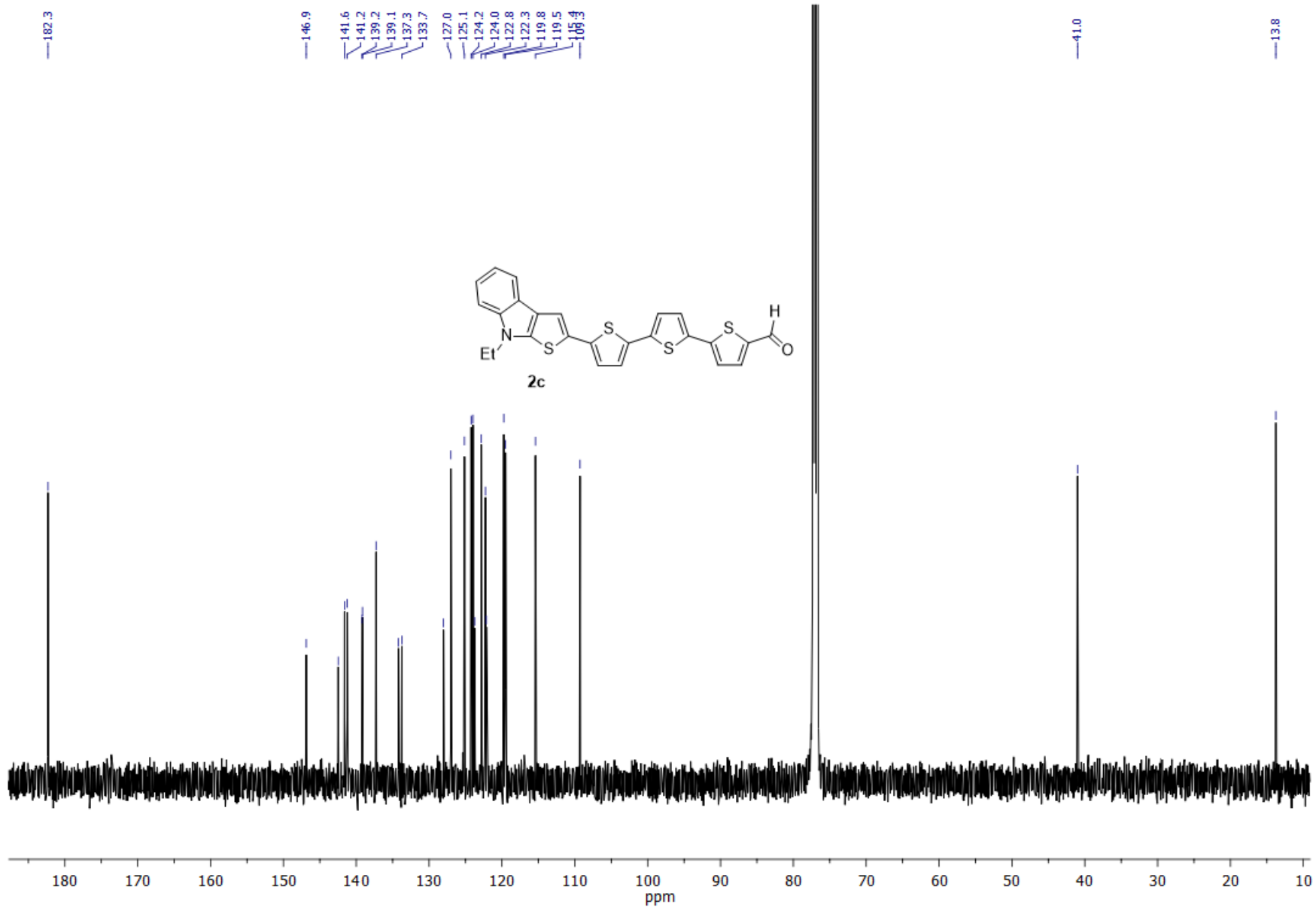


$^{13}\text{C}$  NMR (solvent:  $\text{CDCl}_3$ )

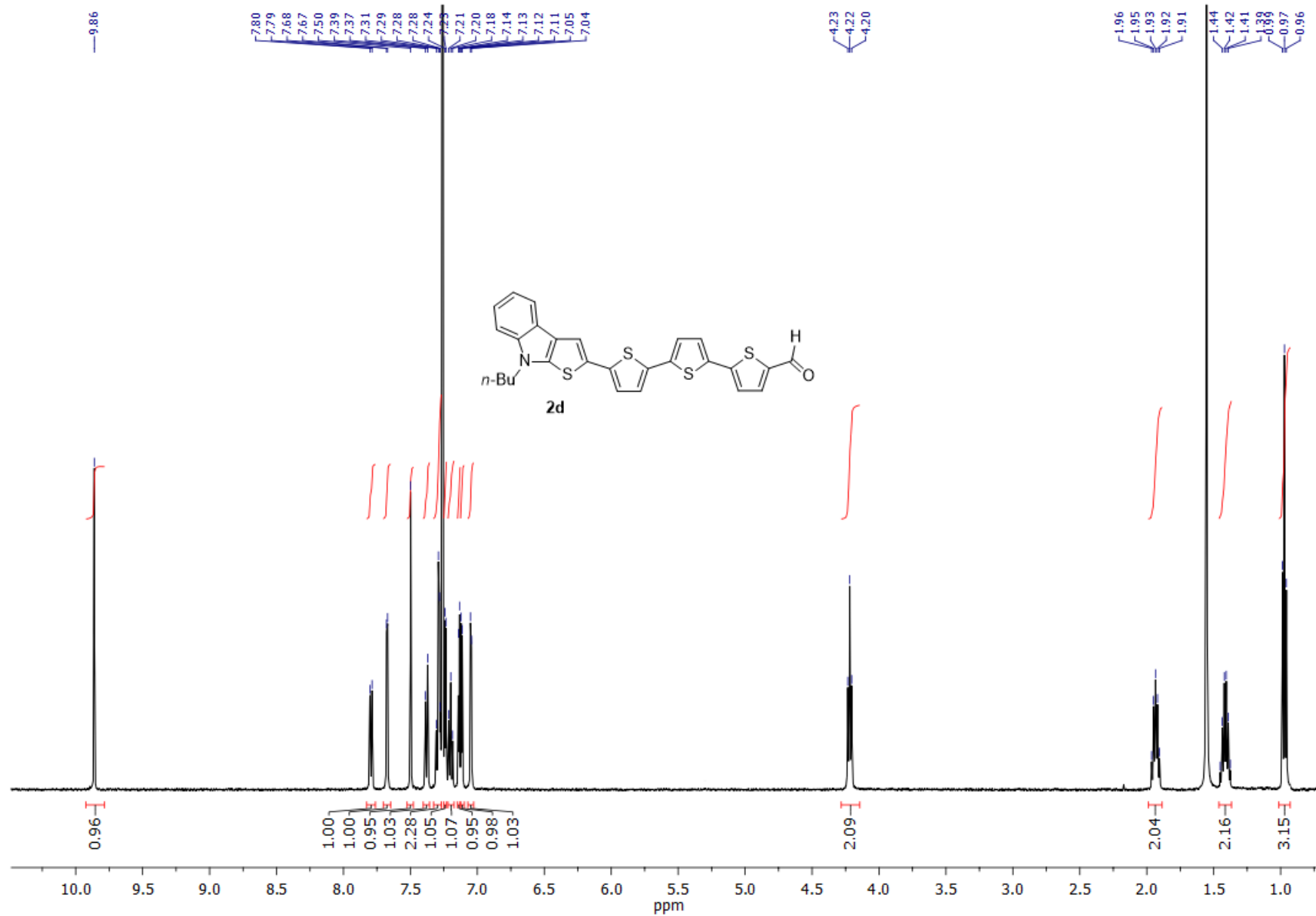
S9

$^1\text{H}$  NMR (solvent:  $\text{CDCl}_3$ )

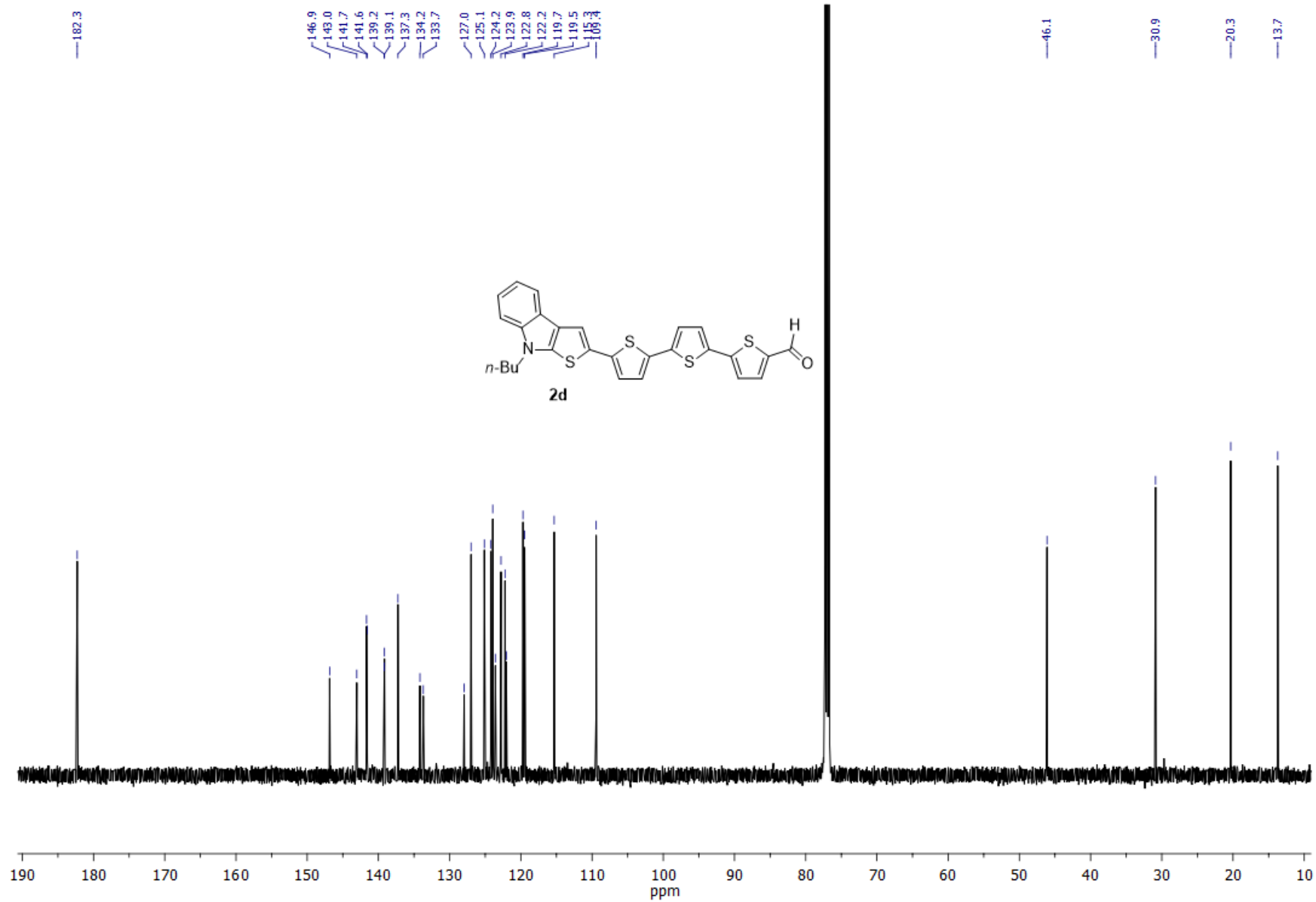
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$^{13}\text{C}$  NMR (solvent:  $\text{CDCl}_3$ )

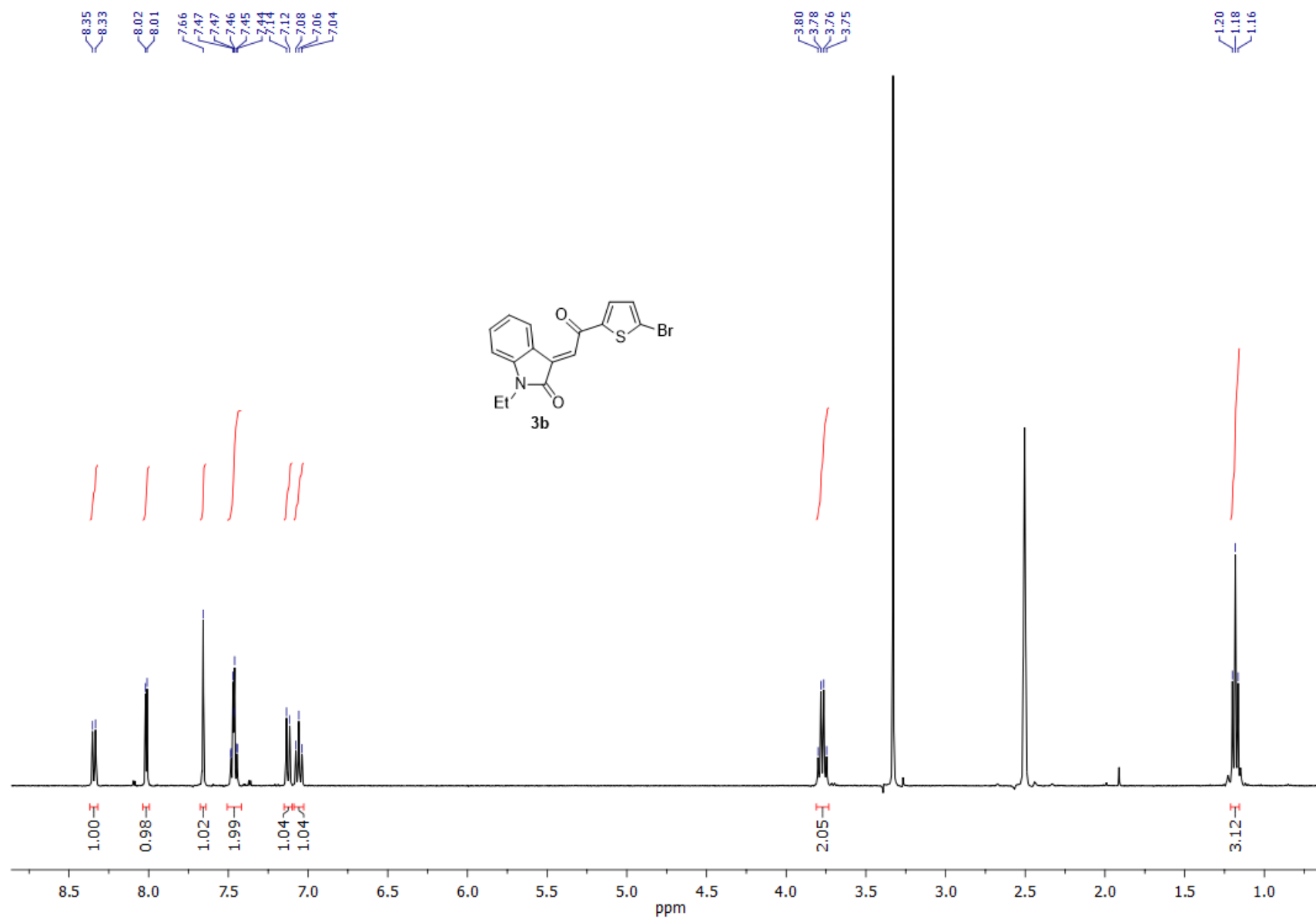
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$^1\text{H}$  NMR (solvent:  $\text{CDCl}_3$ )

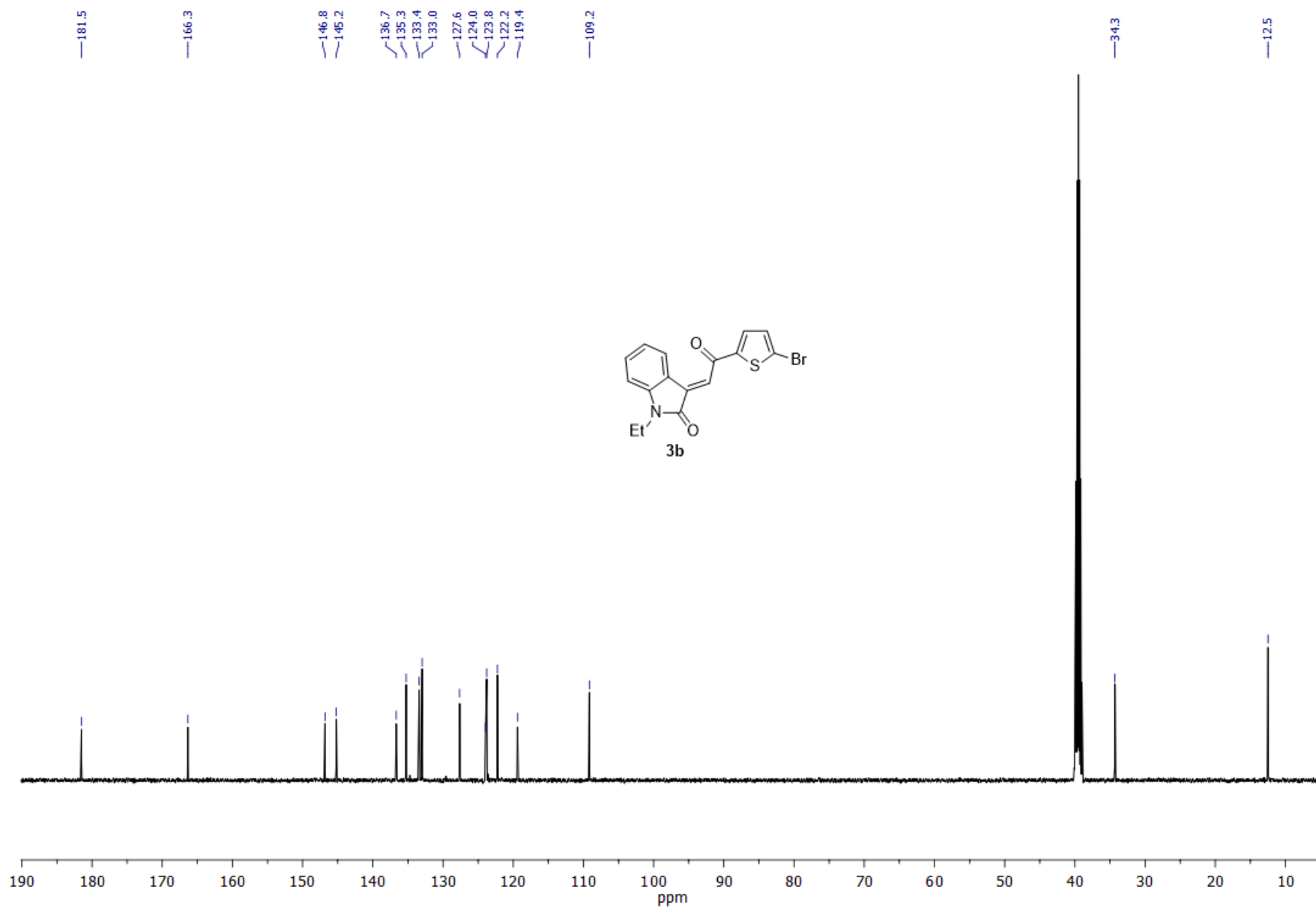
<sup>13</sup>C NMR (solvent: CDCl<sub>3</sub>)

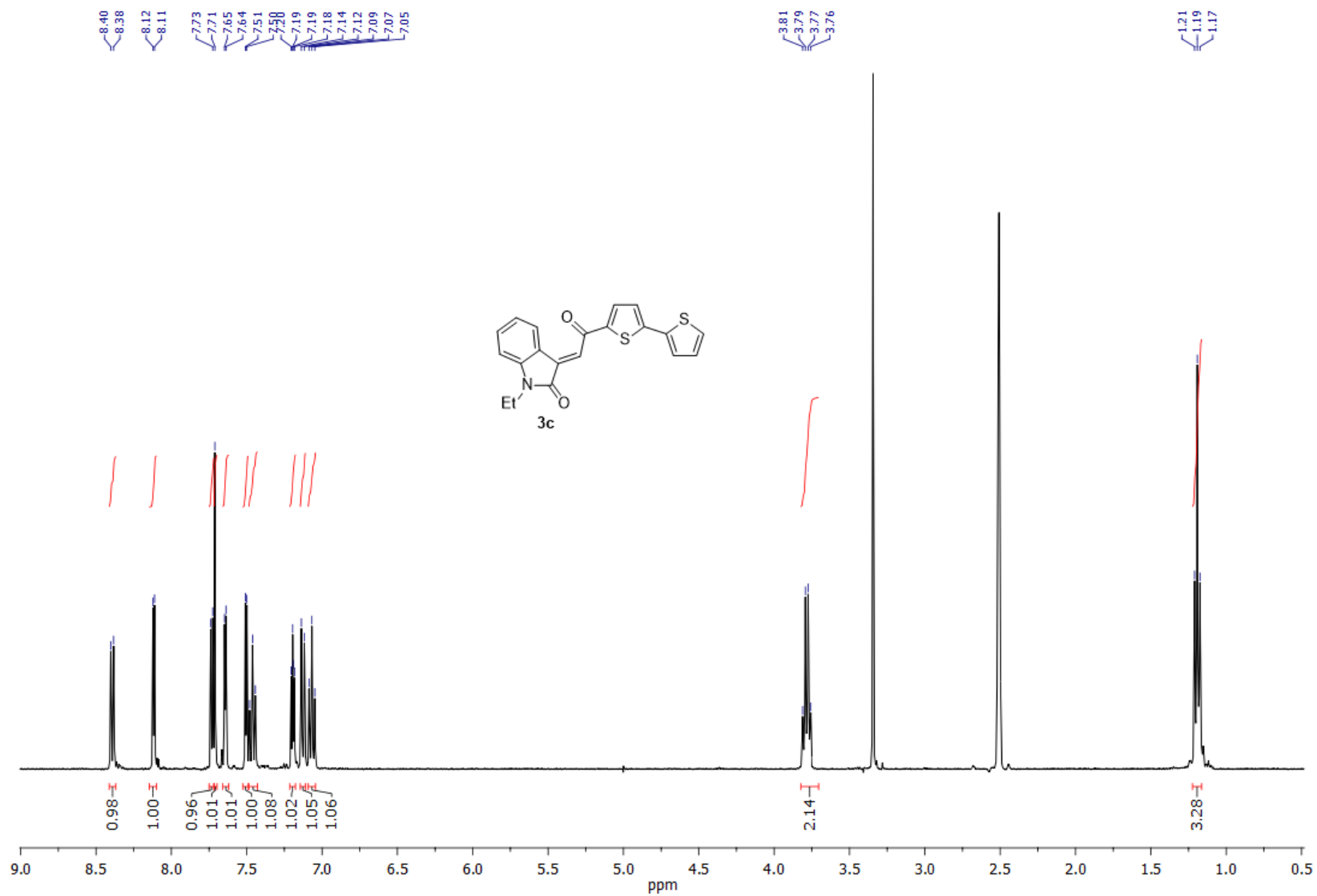


S13

$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

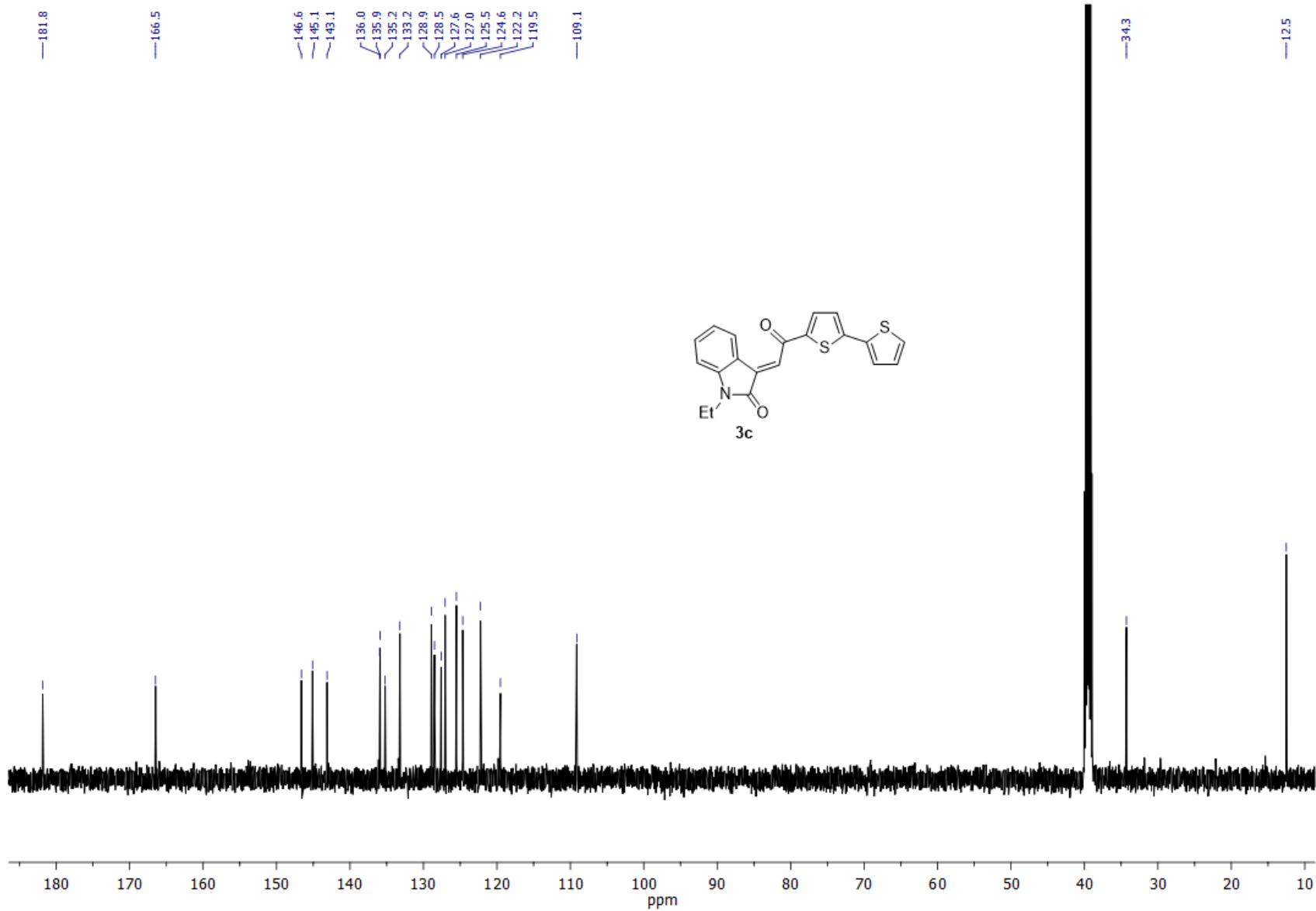
S14

$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

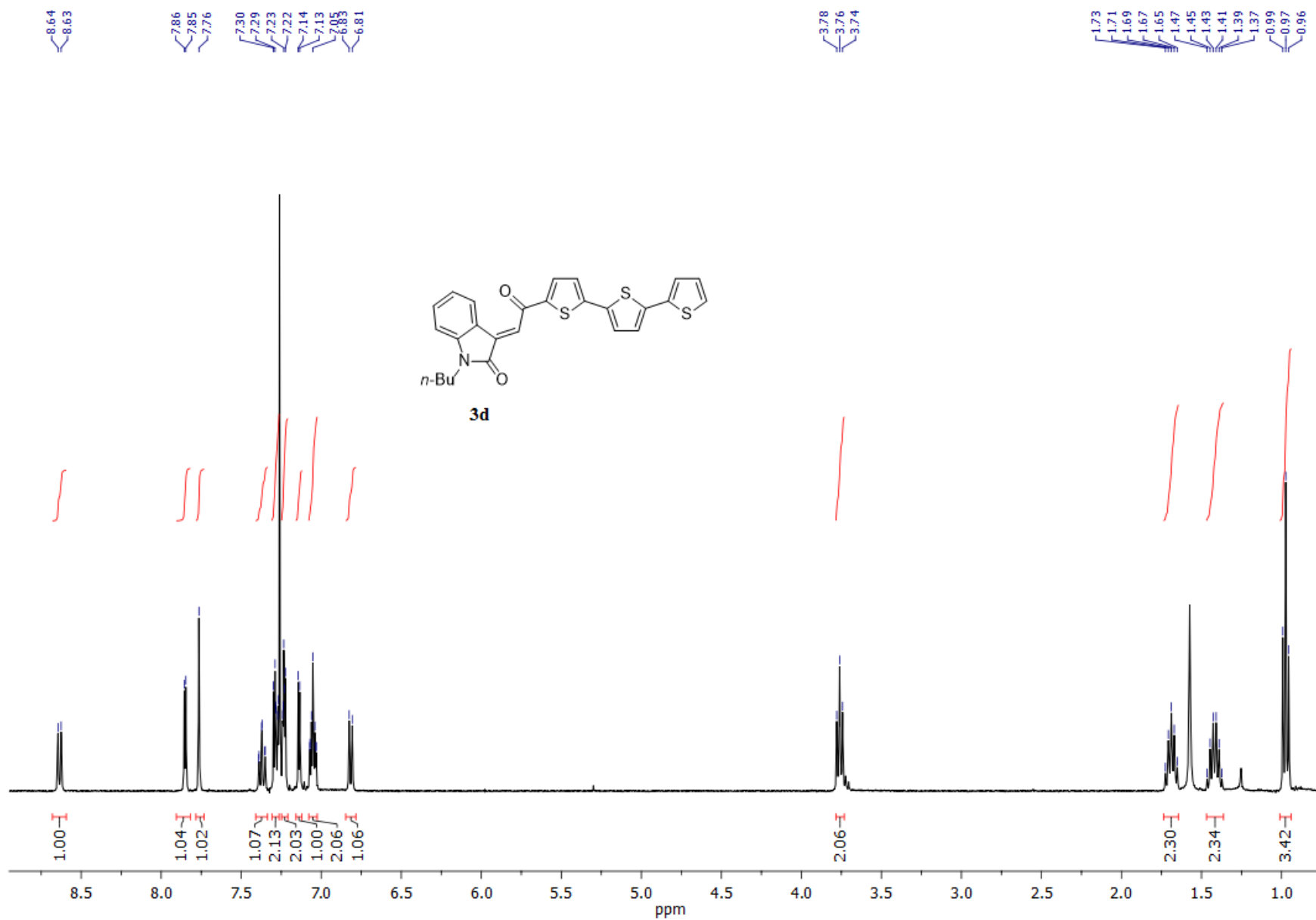
$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

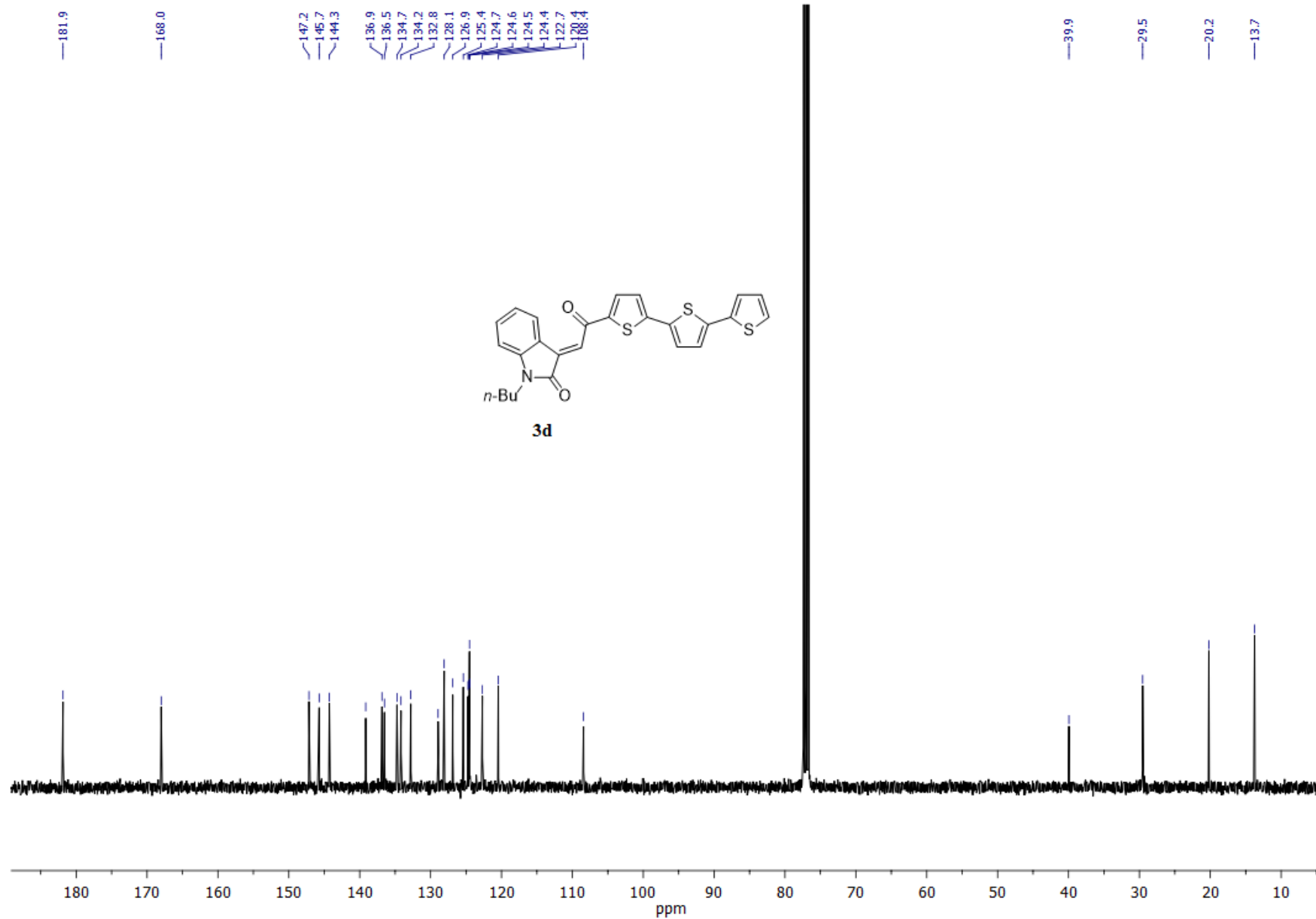
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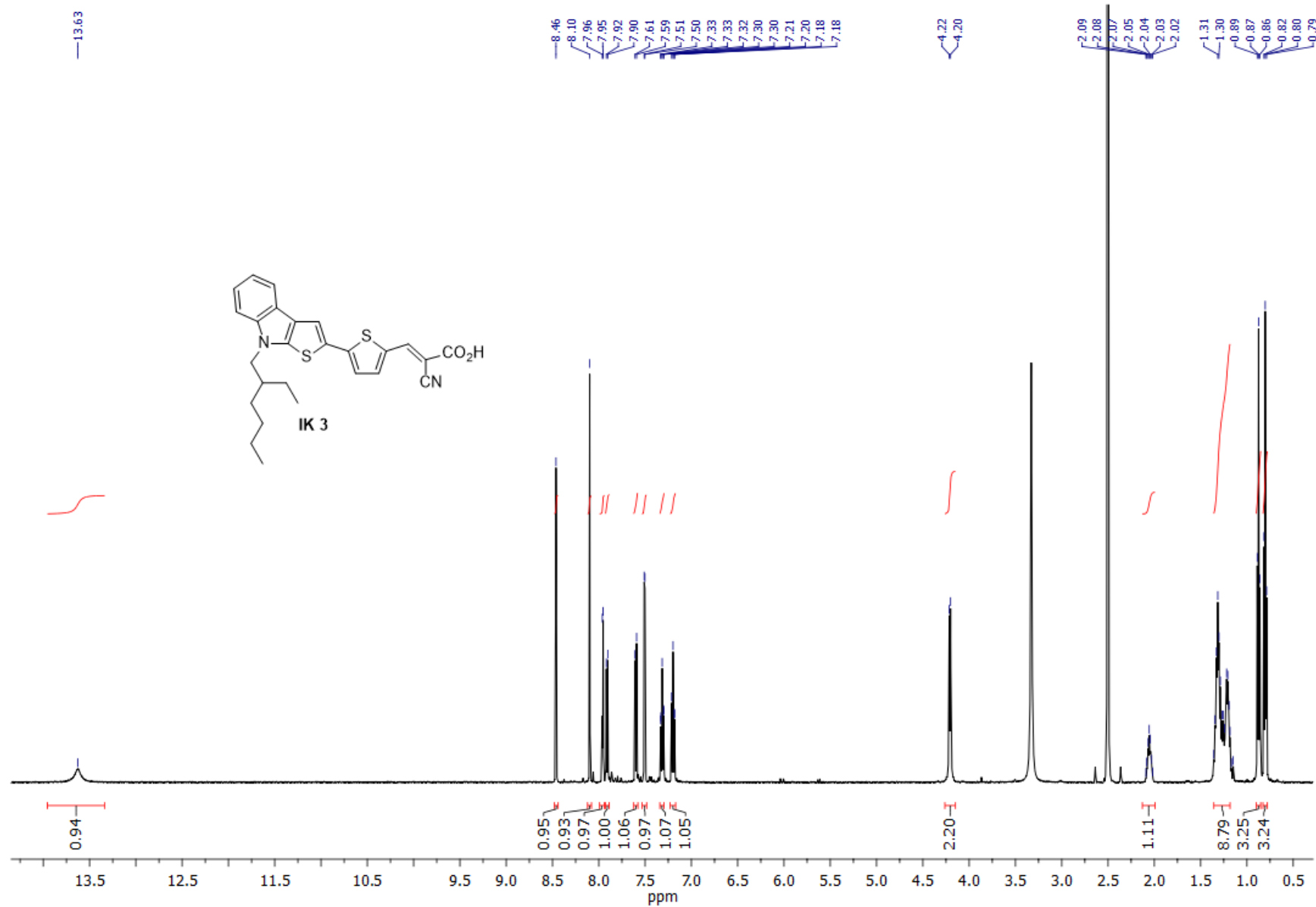
$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S17

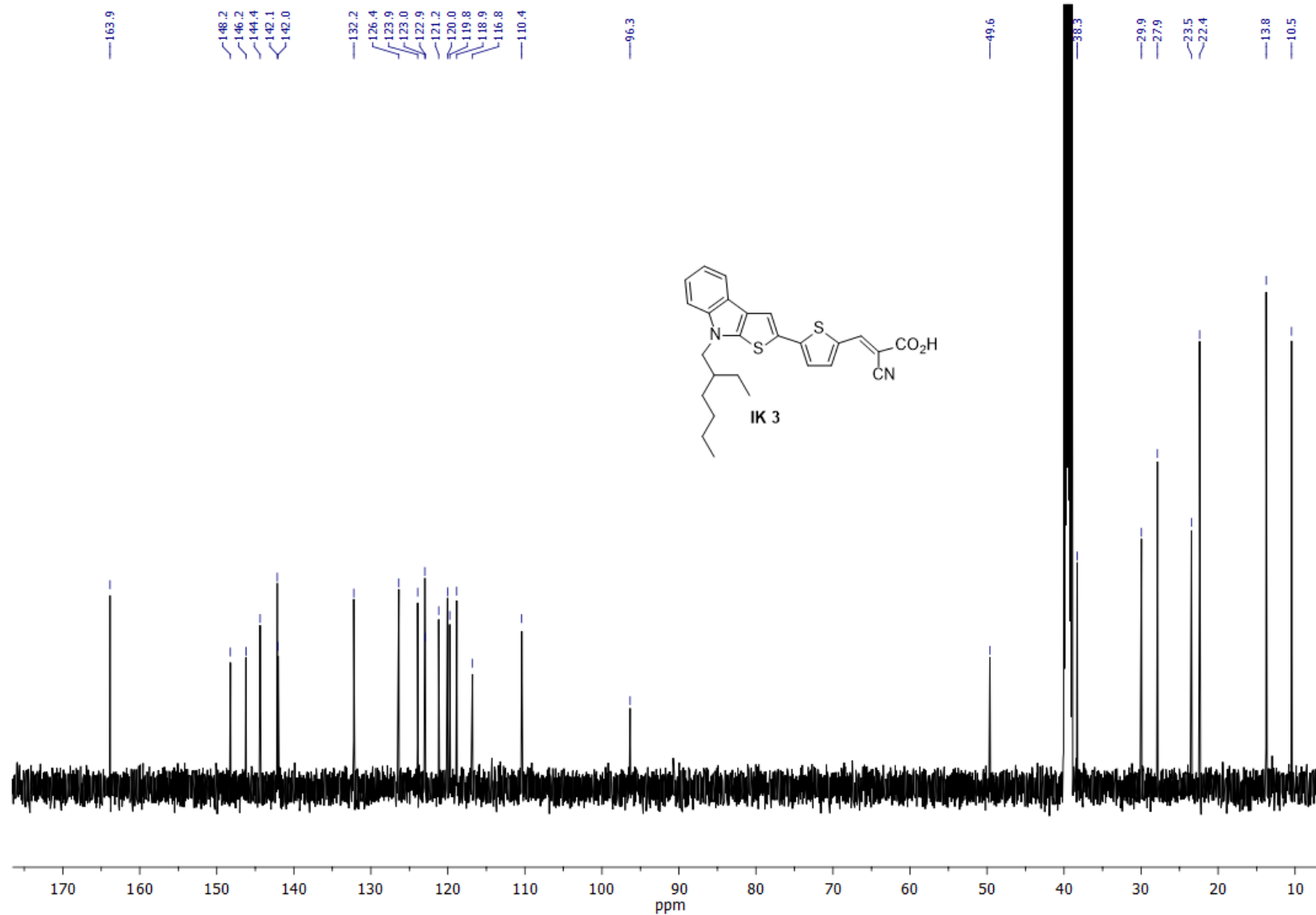
$^1\text{H}$  NMR

$^{13}\text{C}$  NMR

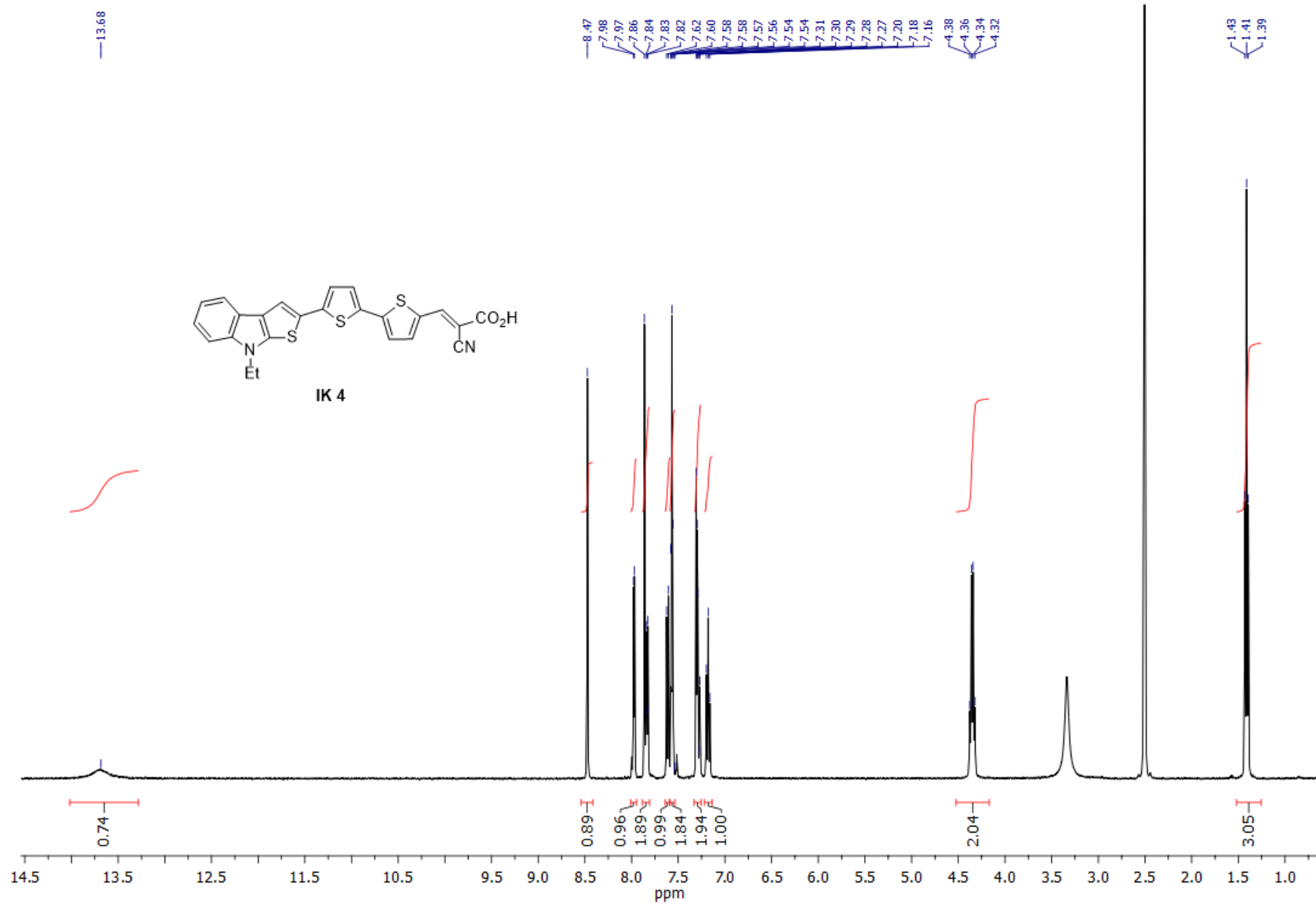
S19

$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

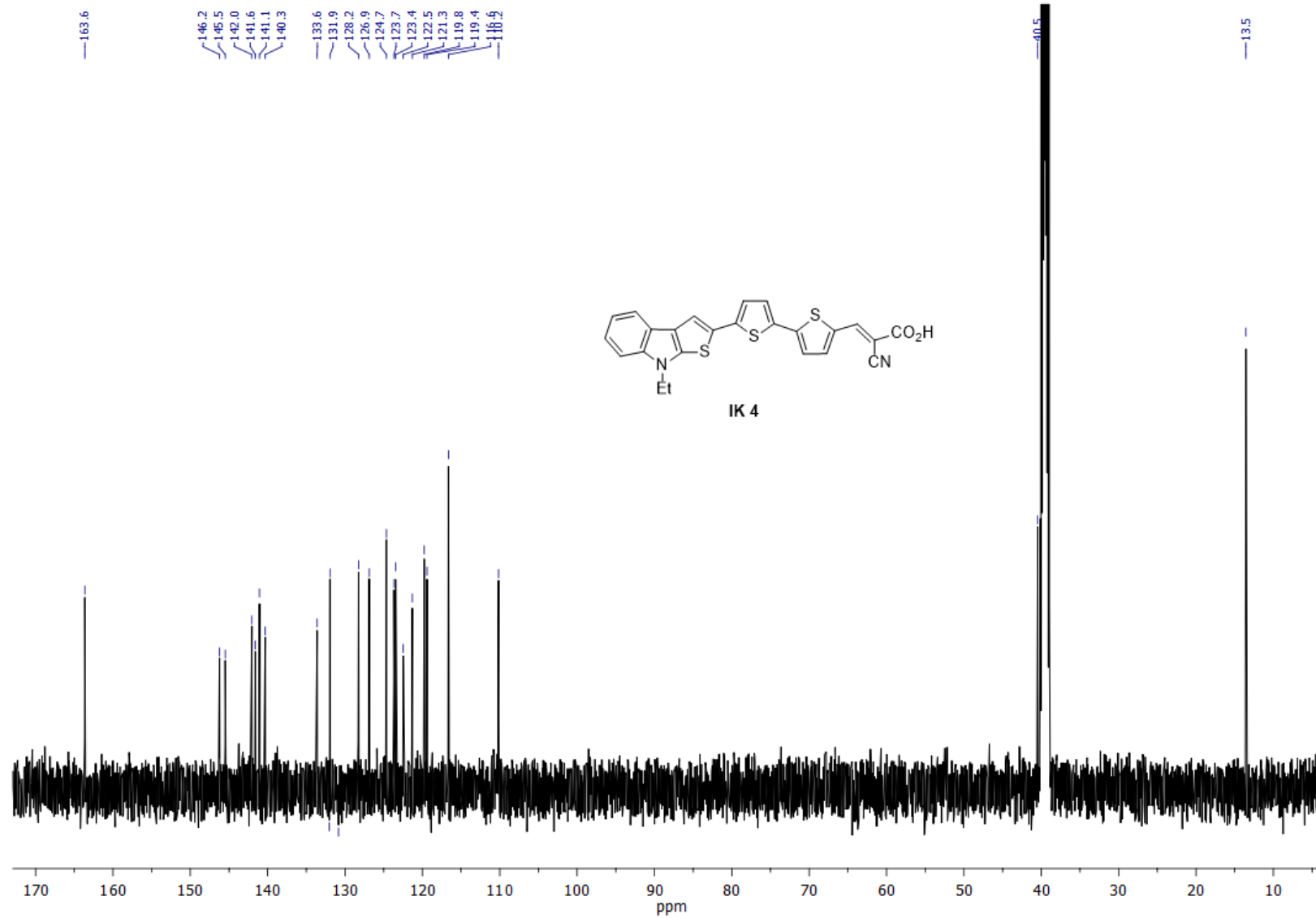
S20

$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

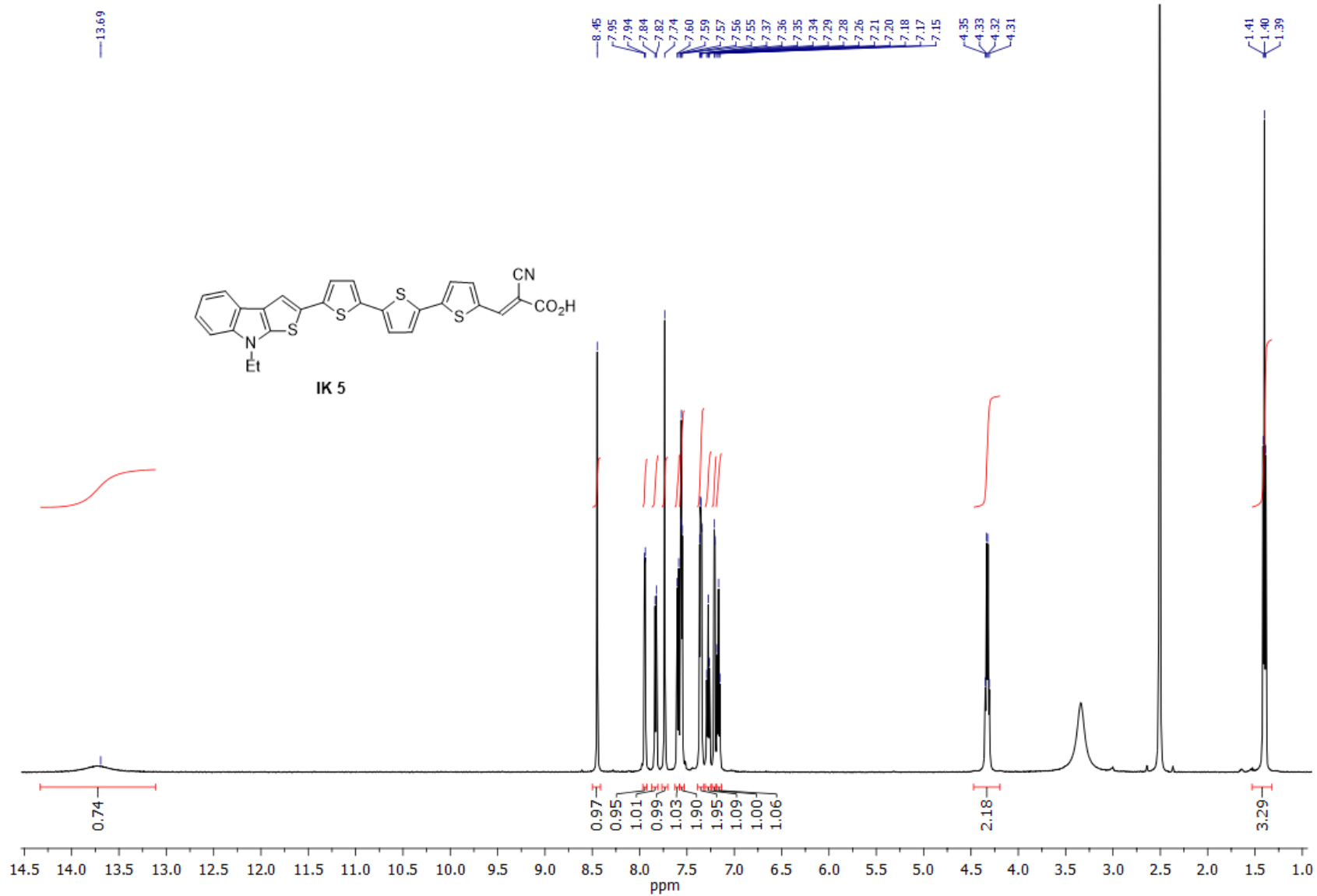
S21

$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S22

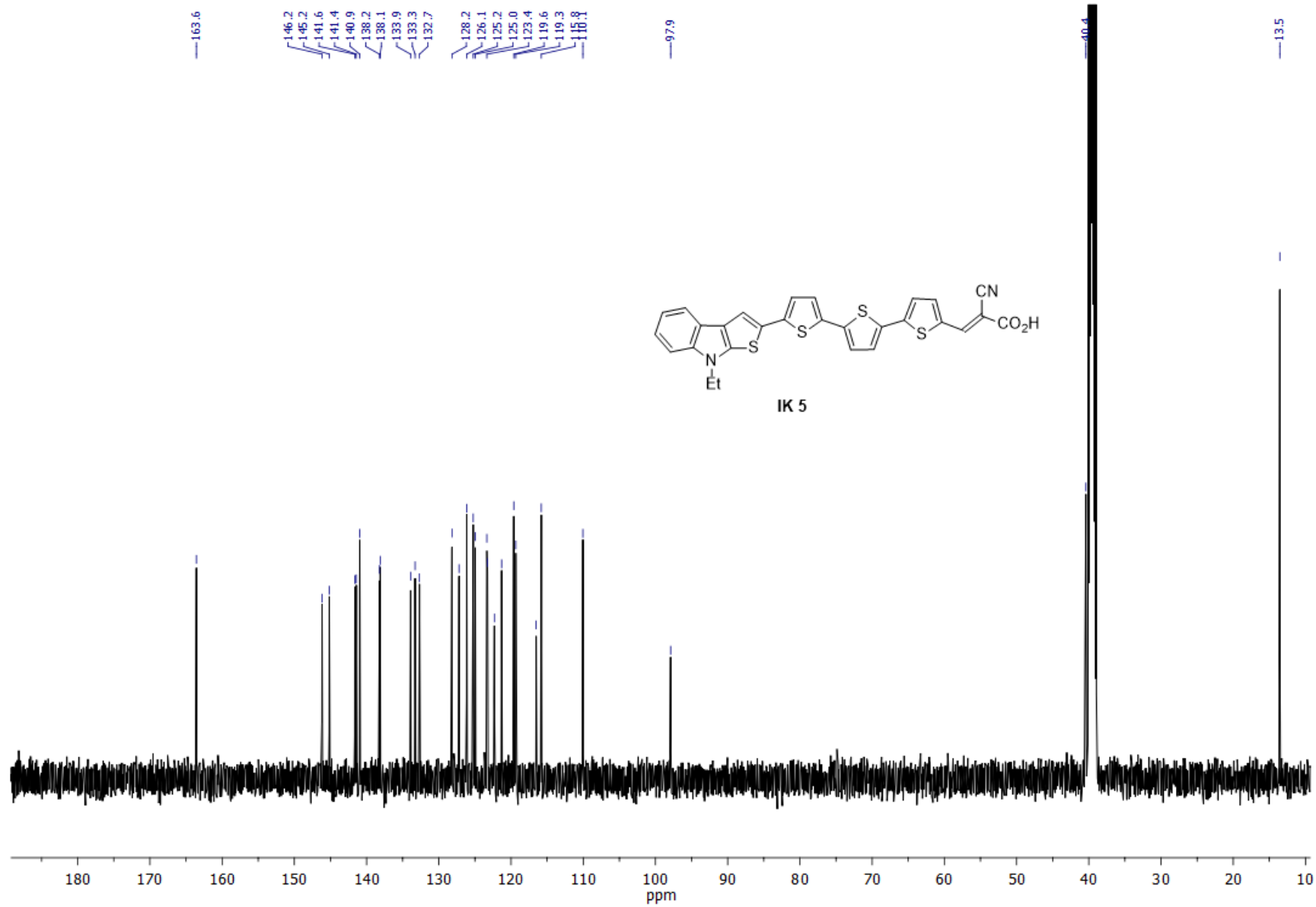
$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S23

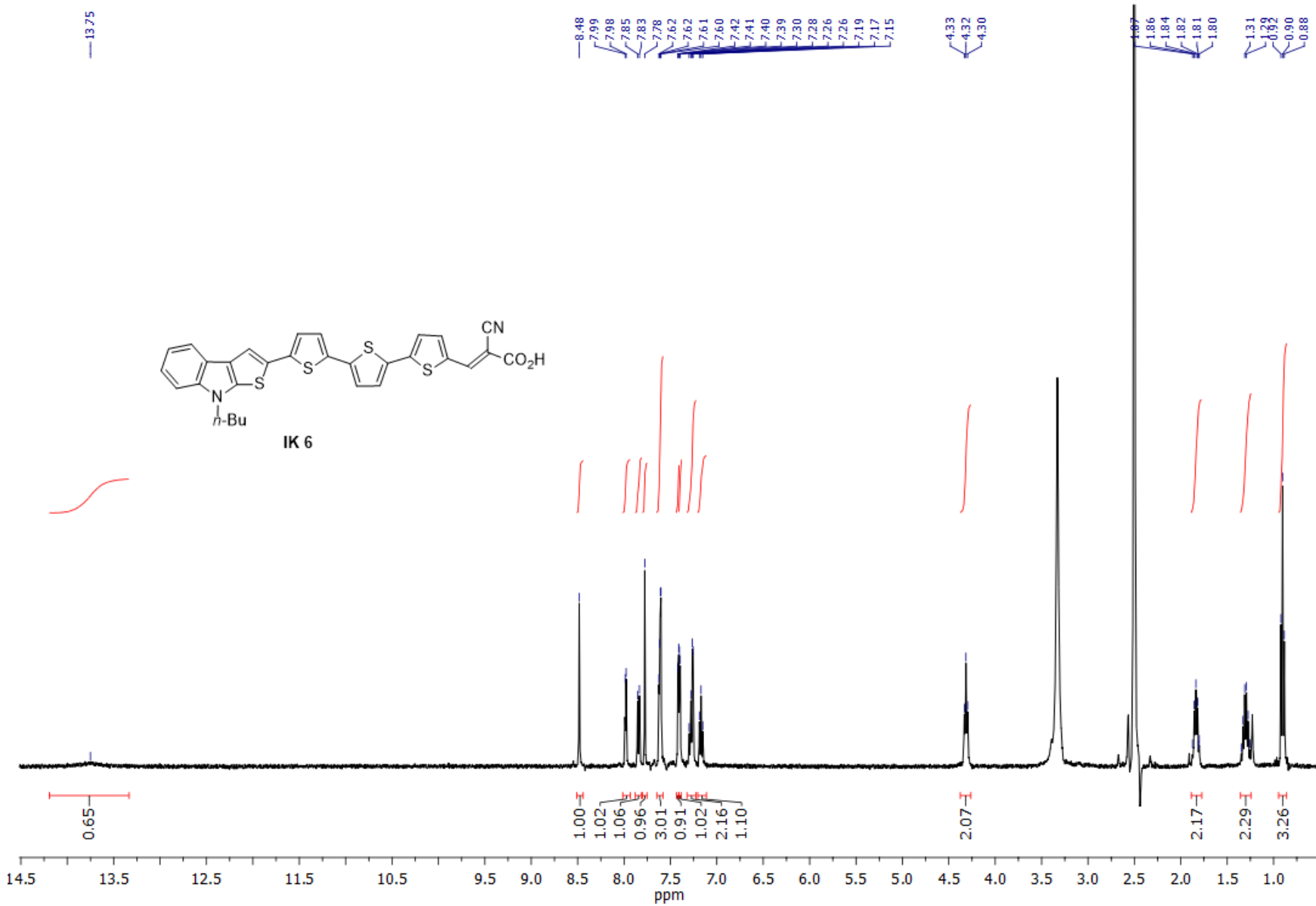
$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S24

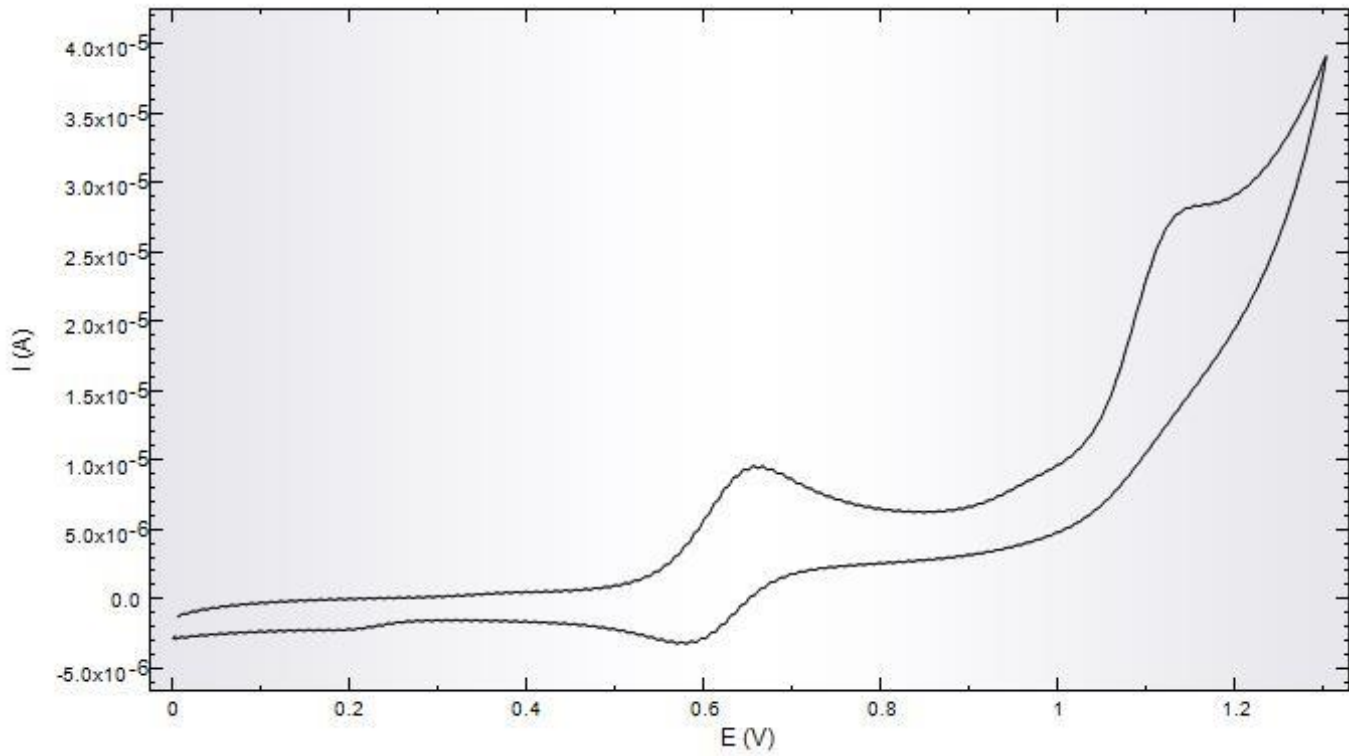
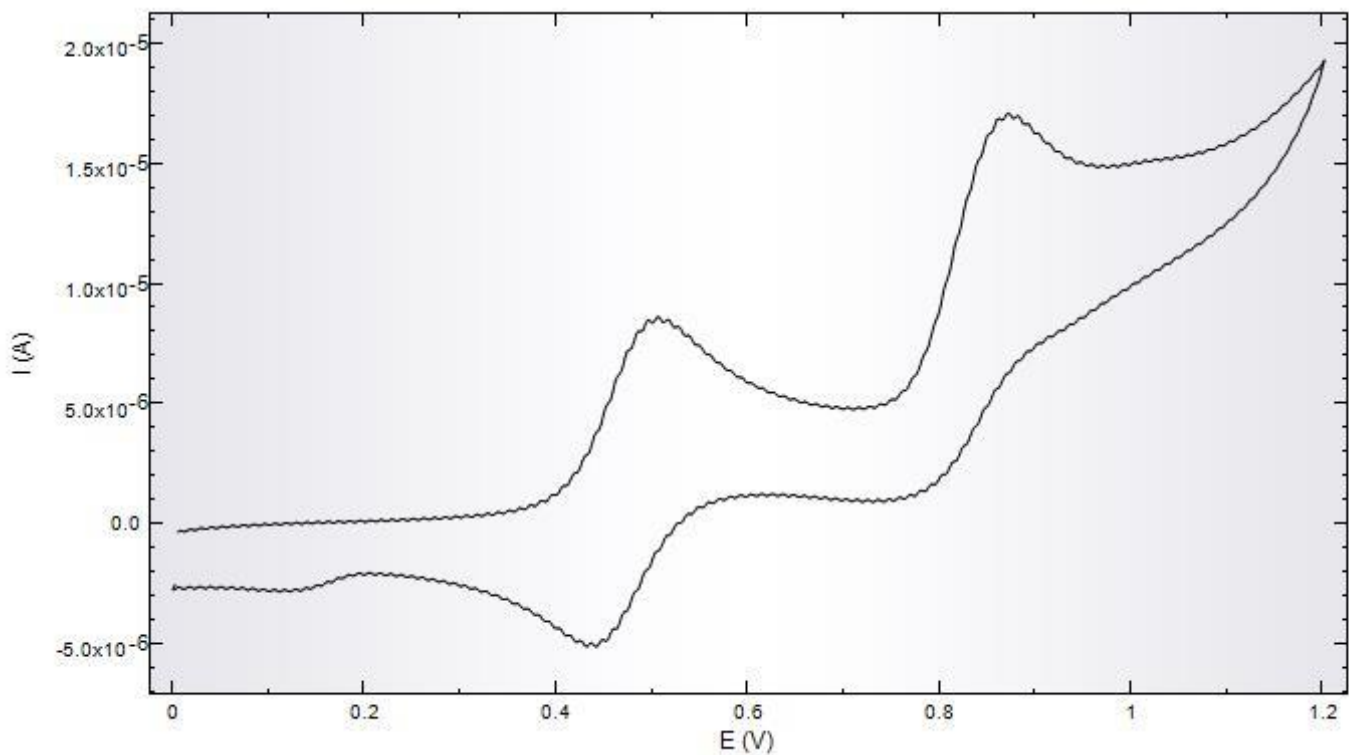


$^{13}\text{C}$  NMR (solvent:  $\text{DMSO-}d_6$ )

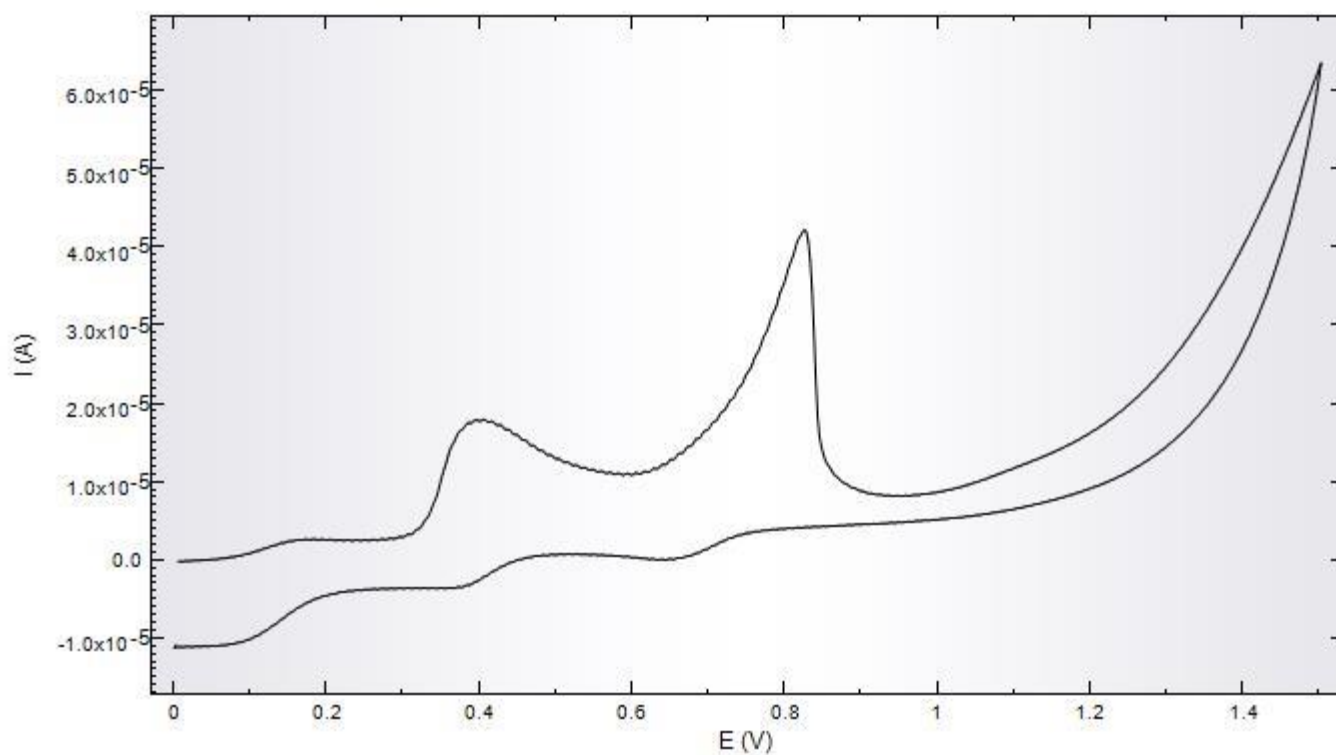
S25

$^1\text{H}$  NMR (solvent:  $\text{DMSO-}d_6$ )

S26

*Cyclic voltammetry (CV) curves of dyes IK 3-6***CV curve of dye IK 3****CV curve of dye IK 4**

S27

**CV curve of dye IK 5****CV curve of dye IK 6**