Electronic Supplementary Material (ESI) for Dalton Transactions


# Stoichiometric and catalytic reactions of $LiAlH_4$ with $Me_2NHBH_3$

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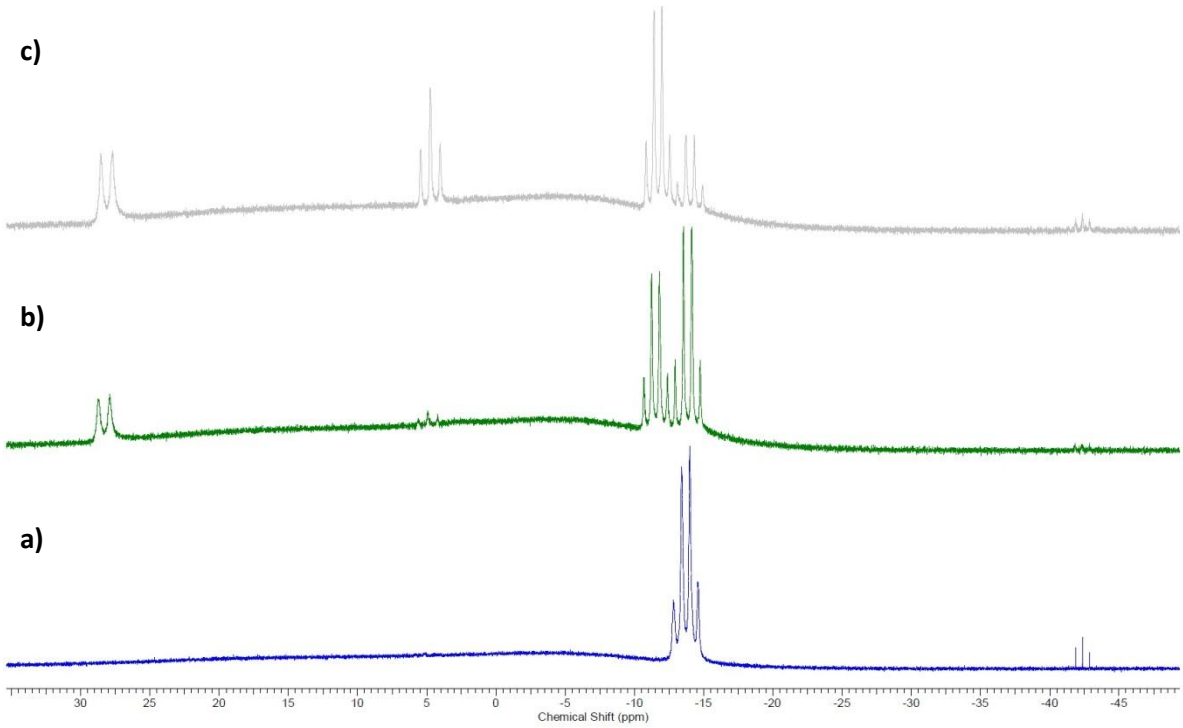
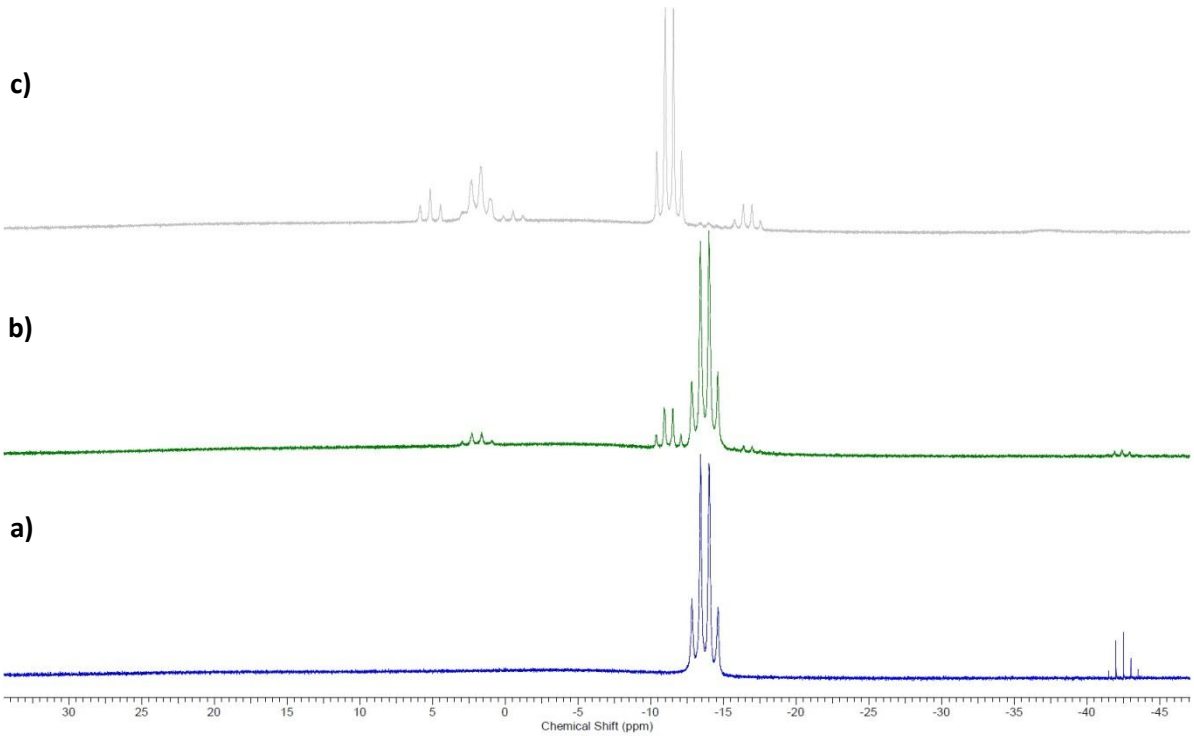
**Electronic Supplementary Information**

NMR spectroscopic studies in thf and toluene: NMR studies were undertaken in Wilmad 528pp tubes fitted with a Young's tap adaptor which allowed the attachment of the tube to a vacuum line during the course of reaction. During reactions evolved $H_2$ gas was therefore allowed to escape from the reaction system. The following spectra refer to a) the reaction mixture immediately after mixing, b) after 72 h stirring at room temperature and c) after reflux for a further 16 h, in each case. Deuterated NMR solvents ($d_8$-toluene, $d_8$-thf) were dried over a sodium mirror.

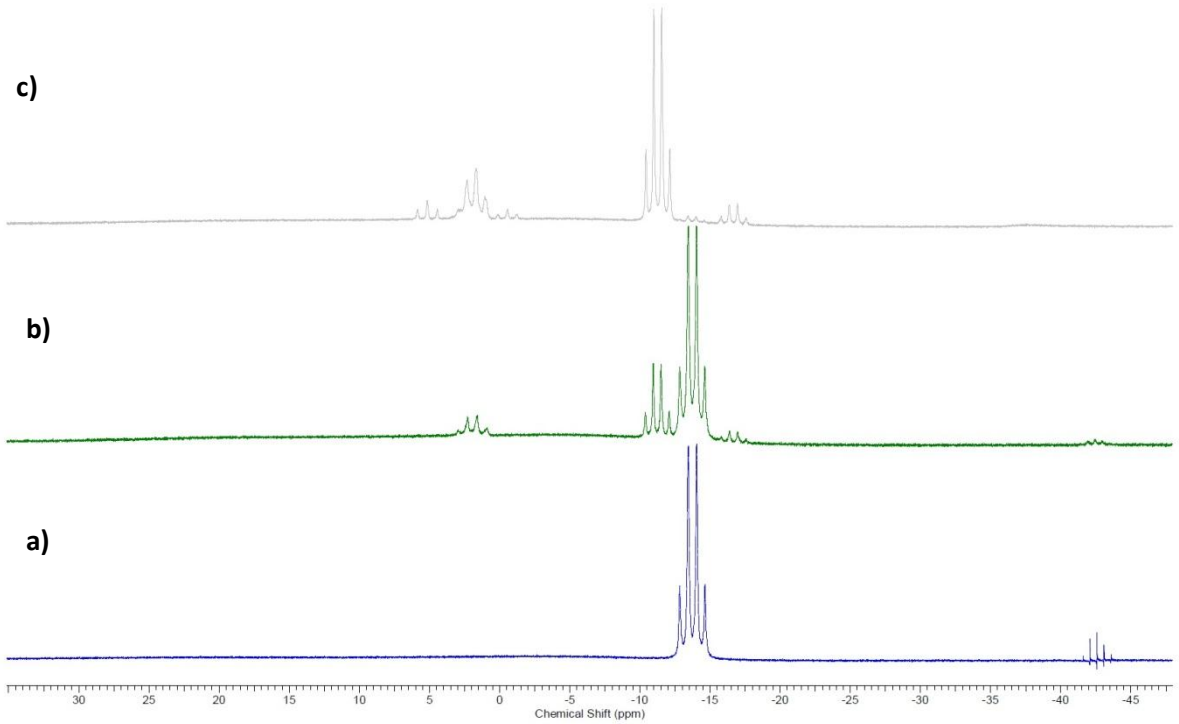
**Spectra in THF**




2 to 1 reaction in THF

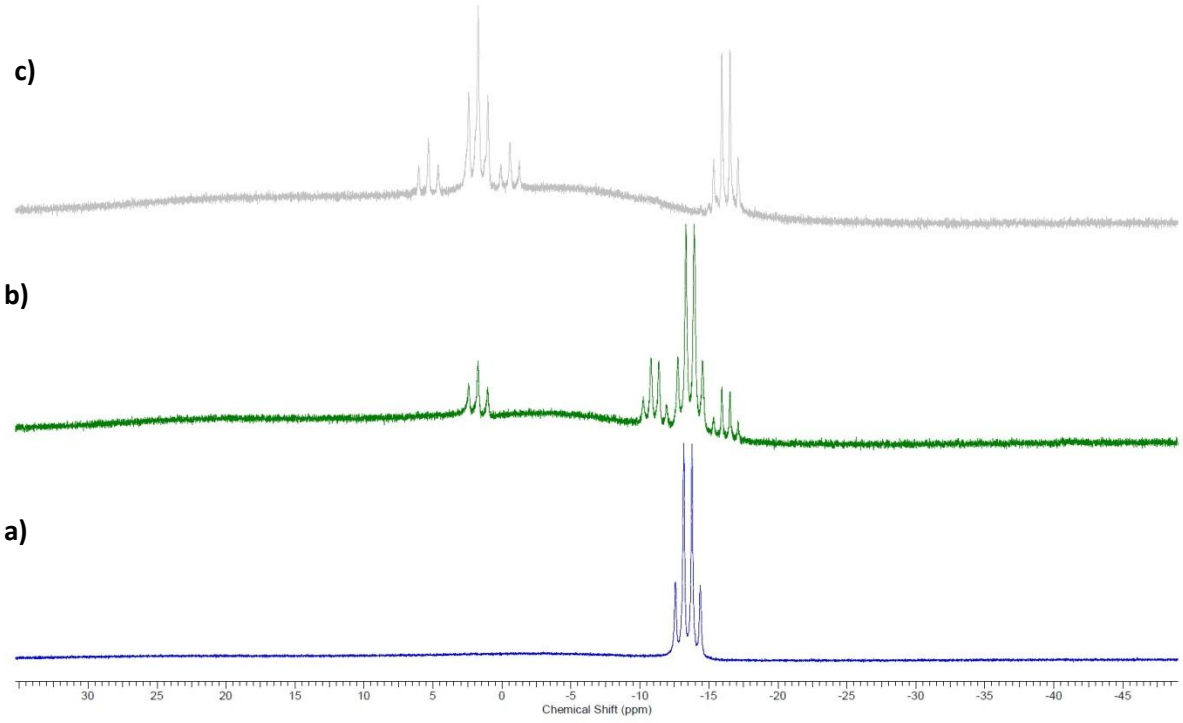



3 to 1 reaction in THF

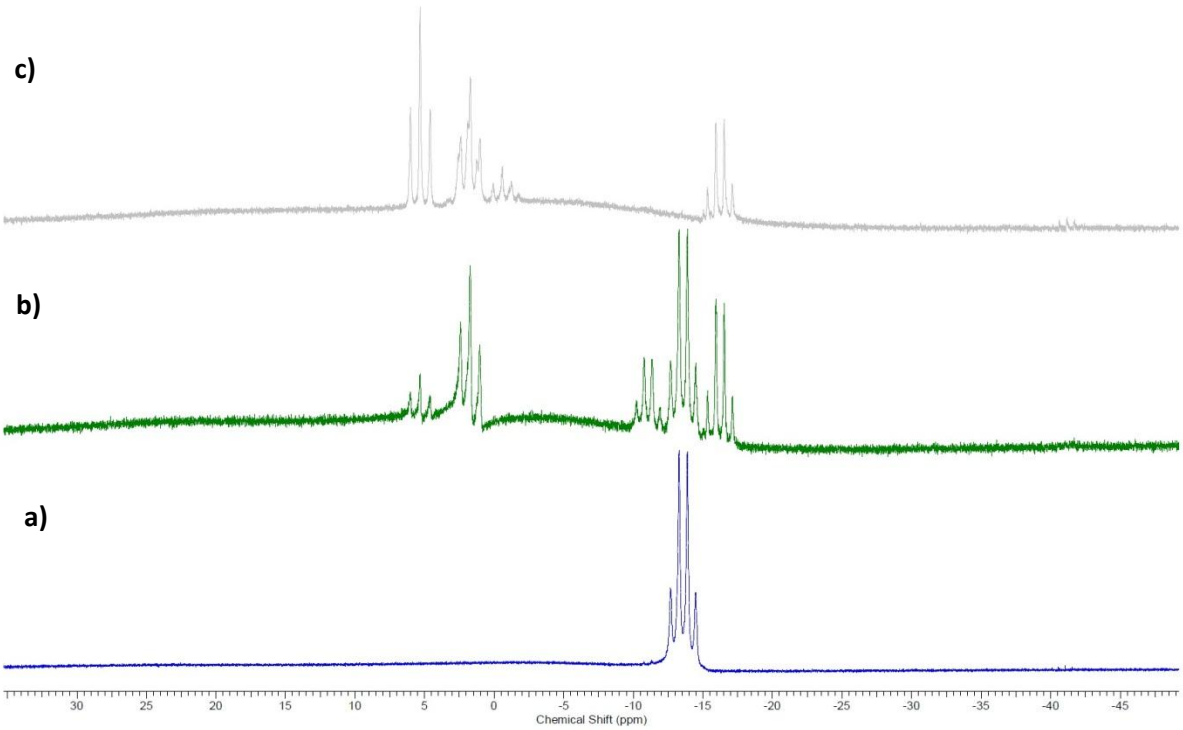



4 to 1 reaction in THF

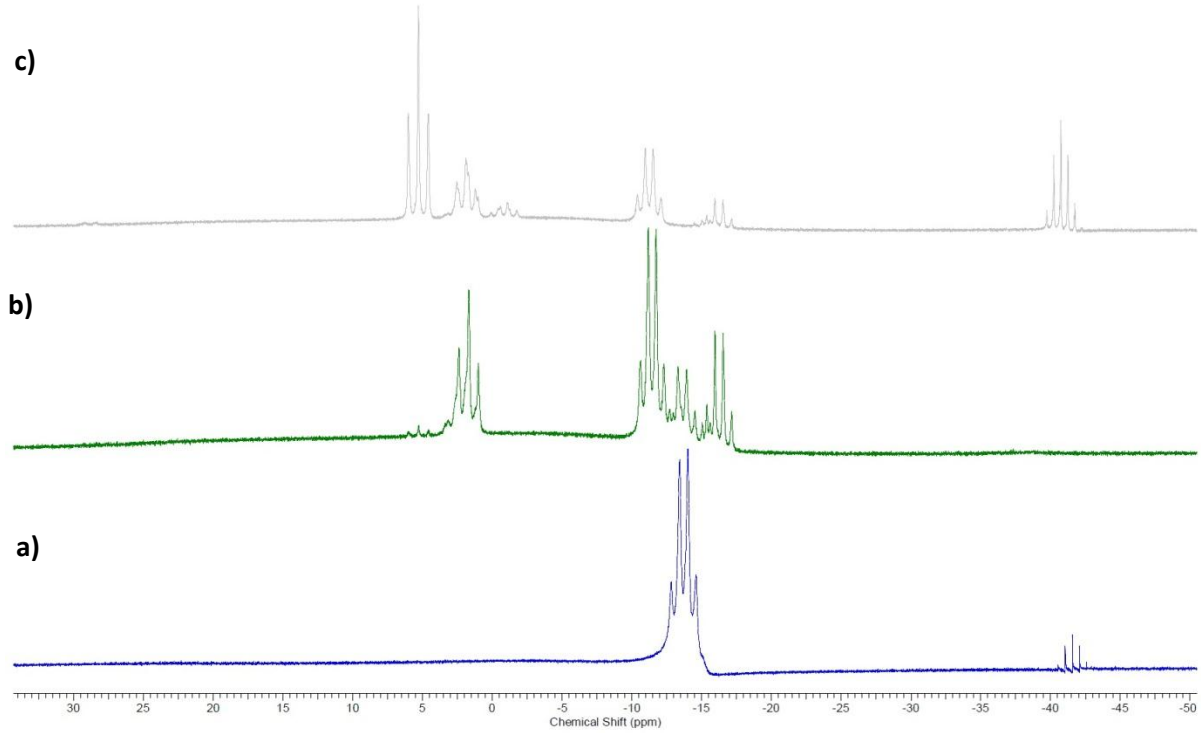
**Spectra in toluene**




2 to 1 reaction in toluene

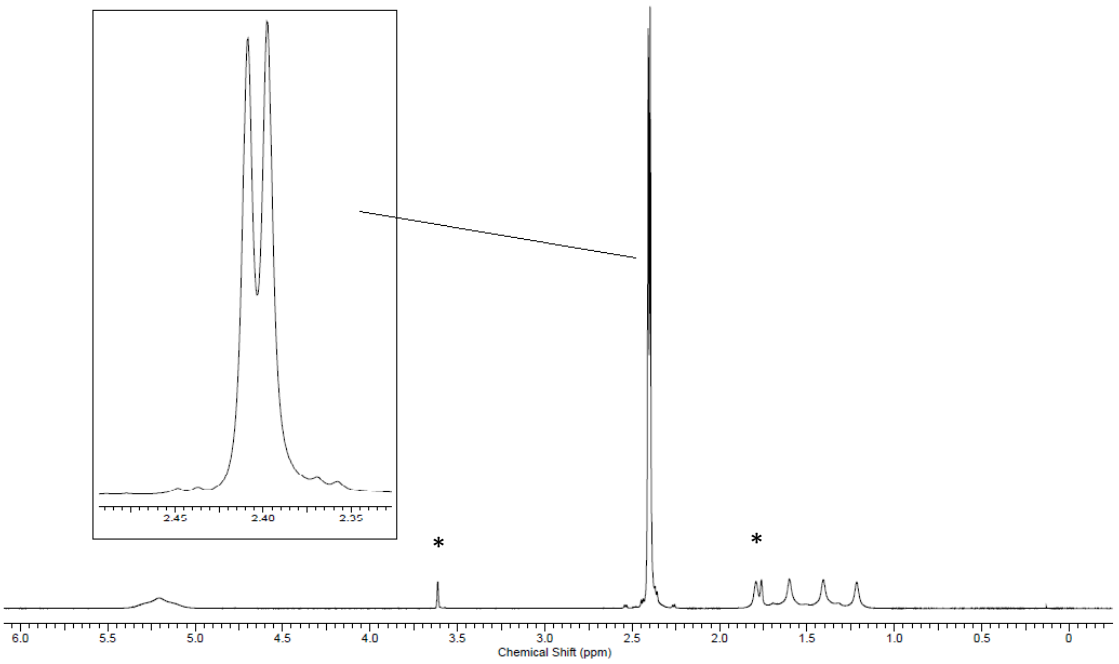



3 to 1 reaction in toluene

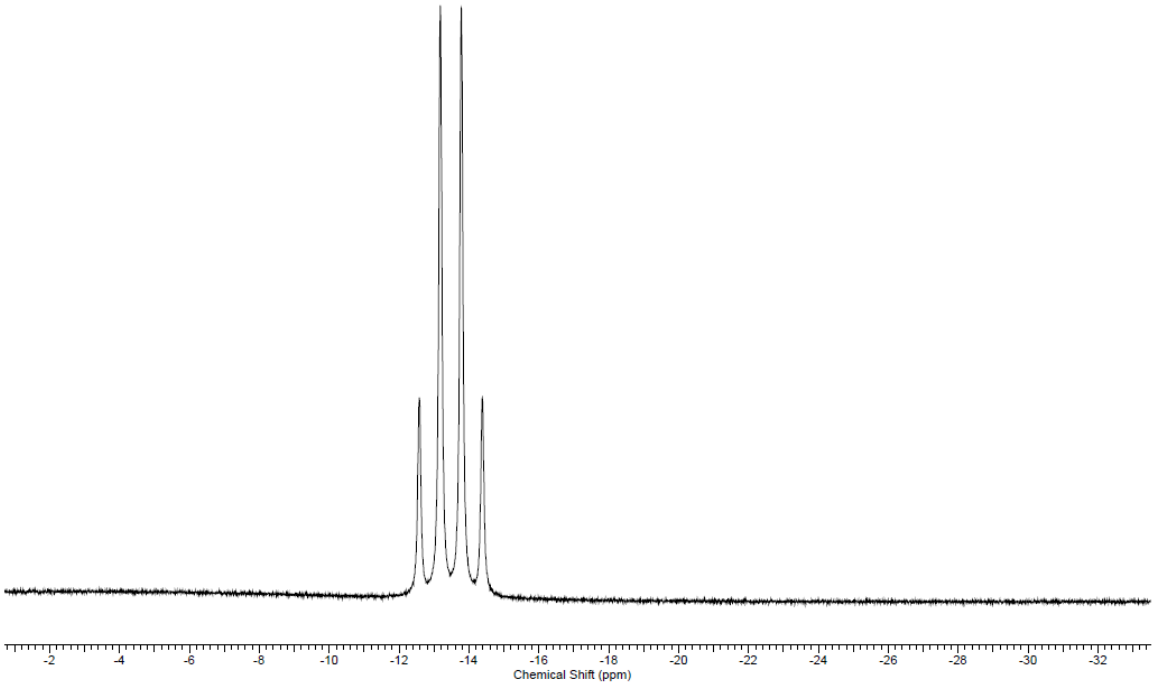



4 to 1 reaction in toluene

**NMR spectra of $Me_2NHBH_3$ in THF**

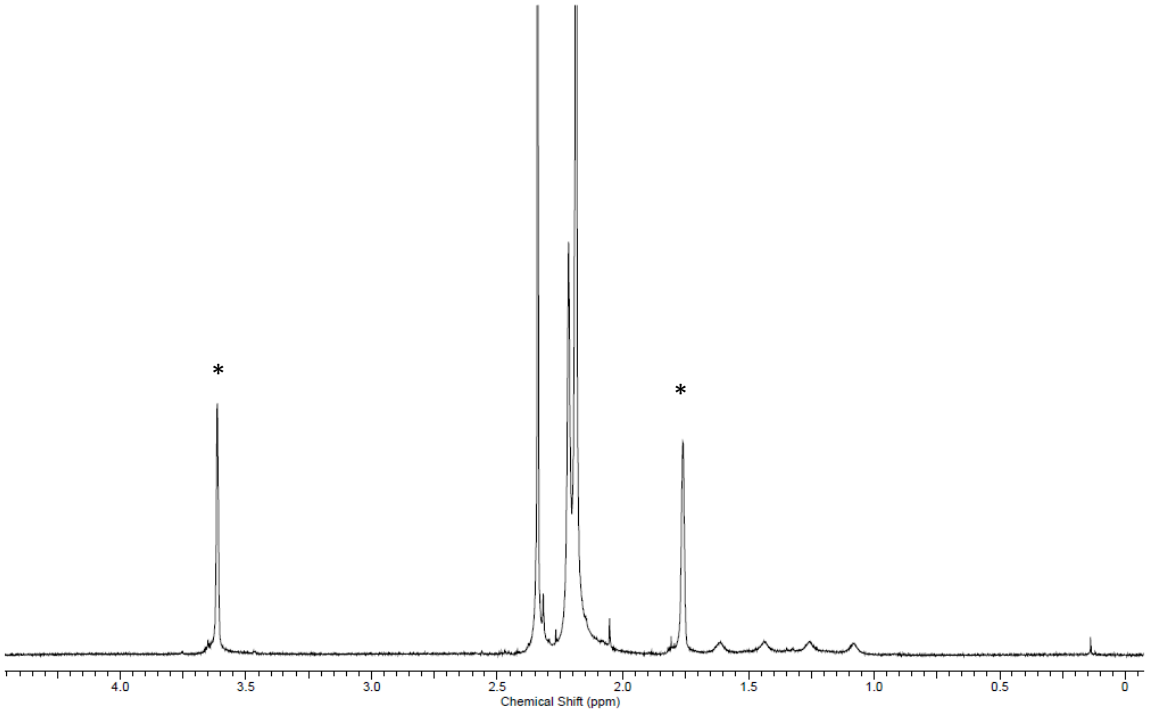



$^{1}$H NMR (500.2 MHz, +25$^{o}$C)

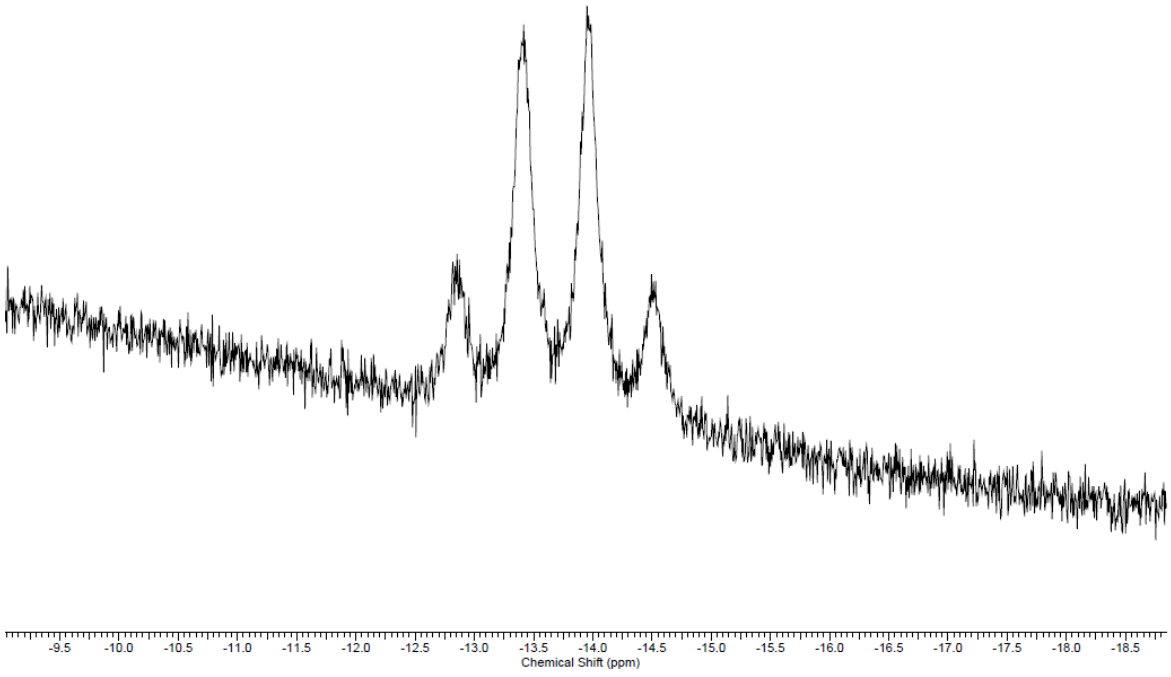



$^{11}$B NMR (160.5MHz, +25$^{o}$C, rel. $BF_3.Et_2O$)

**NMR spectra of 1**

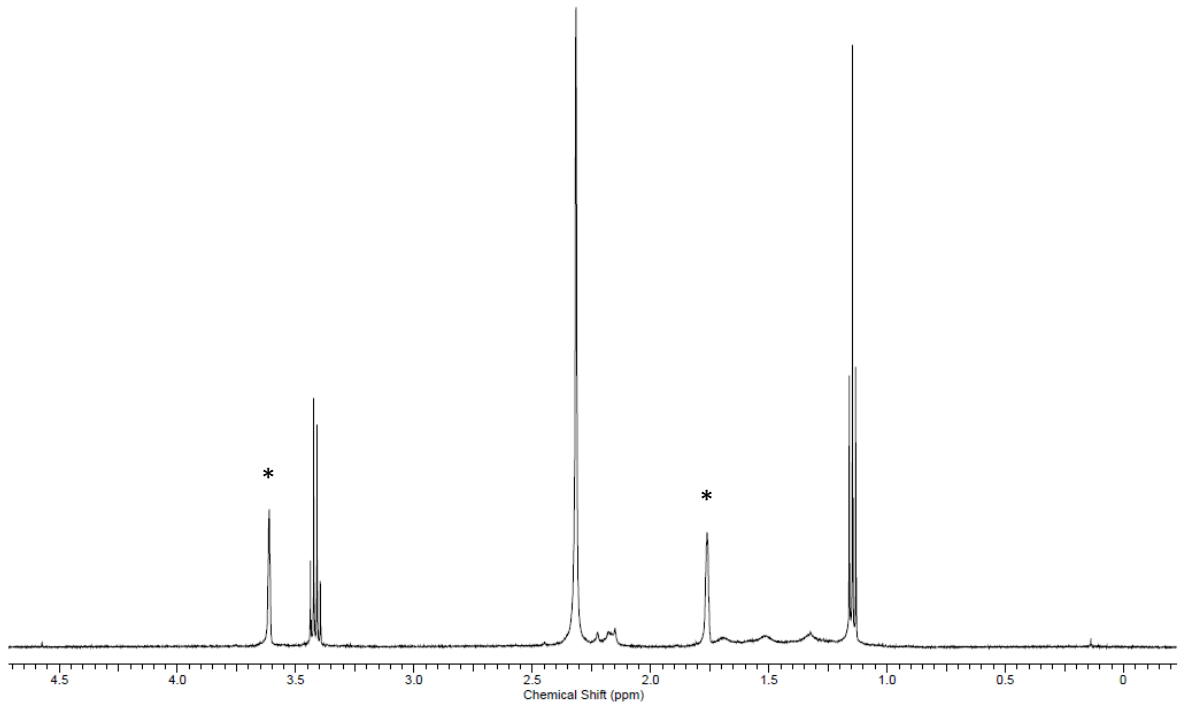



$^{1}$H NMR (500.2 MHz, +25$^{o}$C)

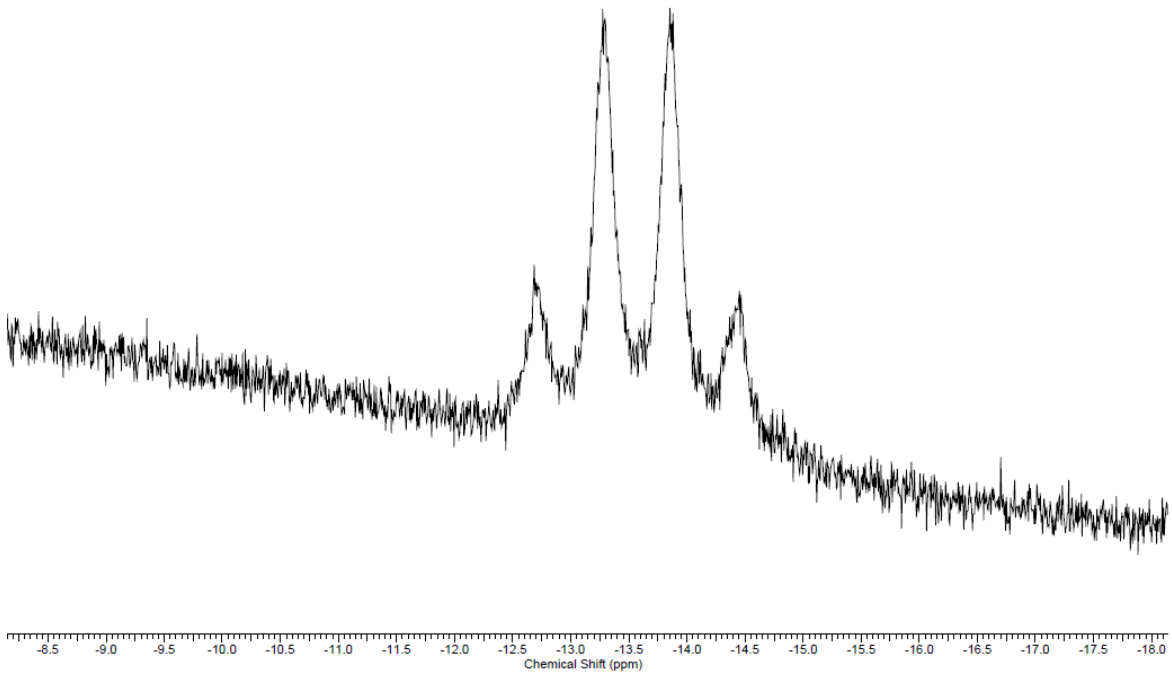



$^{11}$B NMR (160.5MHz, +25$^{o}$C, rel. $BF_3.Et_2O$)

**NMR spectra of 2**

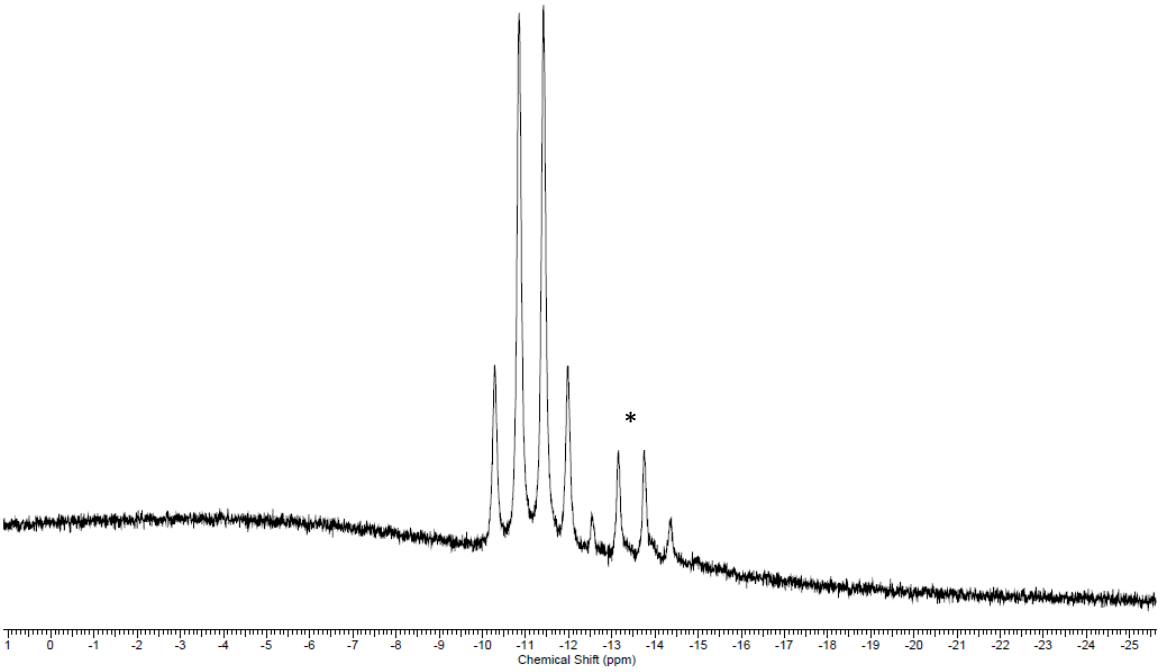



$^{1}$H NMR (500.2 MHz, +25$^{o}$C)




$^{11}$B NMR (160.5MHz, +25$^{o}$C, rel. $BF_3.Et_2O$)

## $^{11}$B NMR spectra of 4




$^{11}$B NMR (160.5MHz, +25$^{o}$C, rel. $BF_3.Et_2O$) (* contamination of the sample with **1**/**2**)