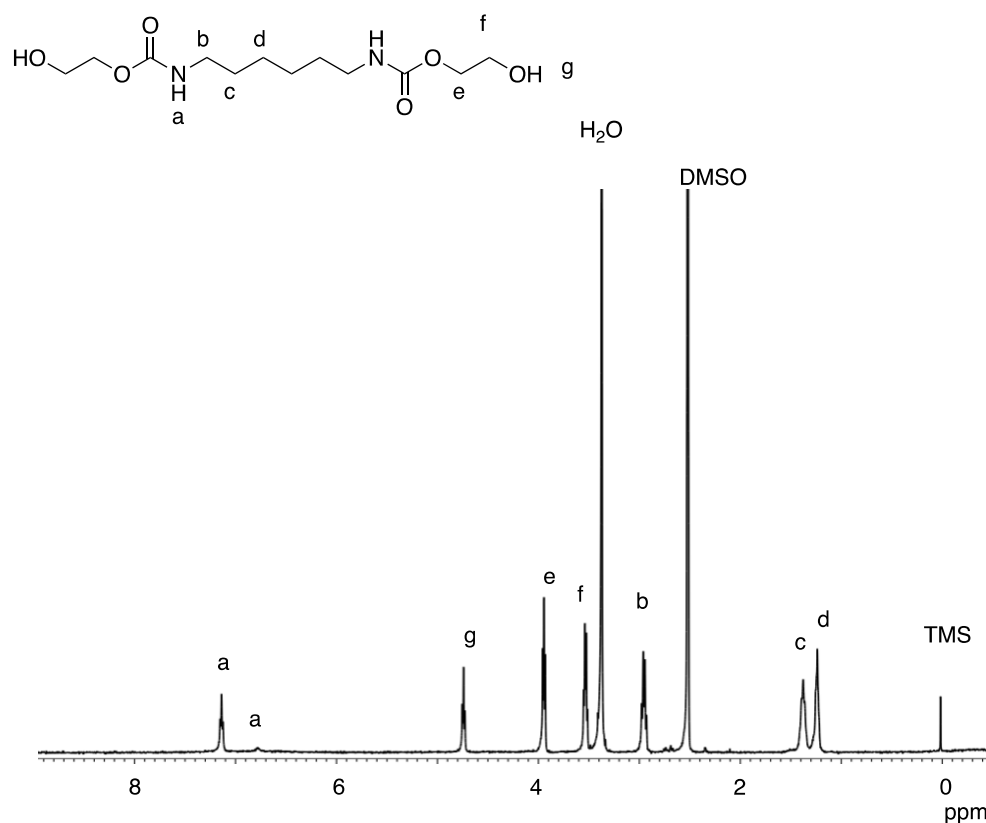


Supplementary Materials for

# Non-isocyanate synthesis of aliphatic polyurethane by $\text{BiCl}_3$ -catalyzed transurethanization polycondensation

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**Figure S1.**  $^1\text{H}$  NMR spectrum of BHU6 ( $d_6$ -DMSO, 400 MHz).

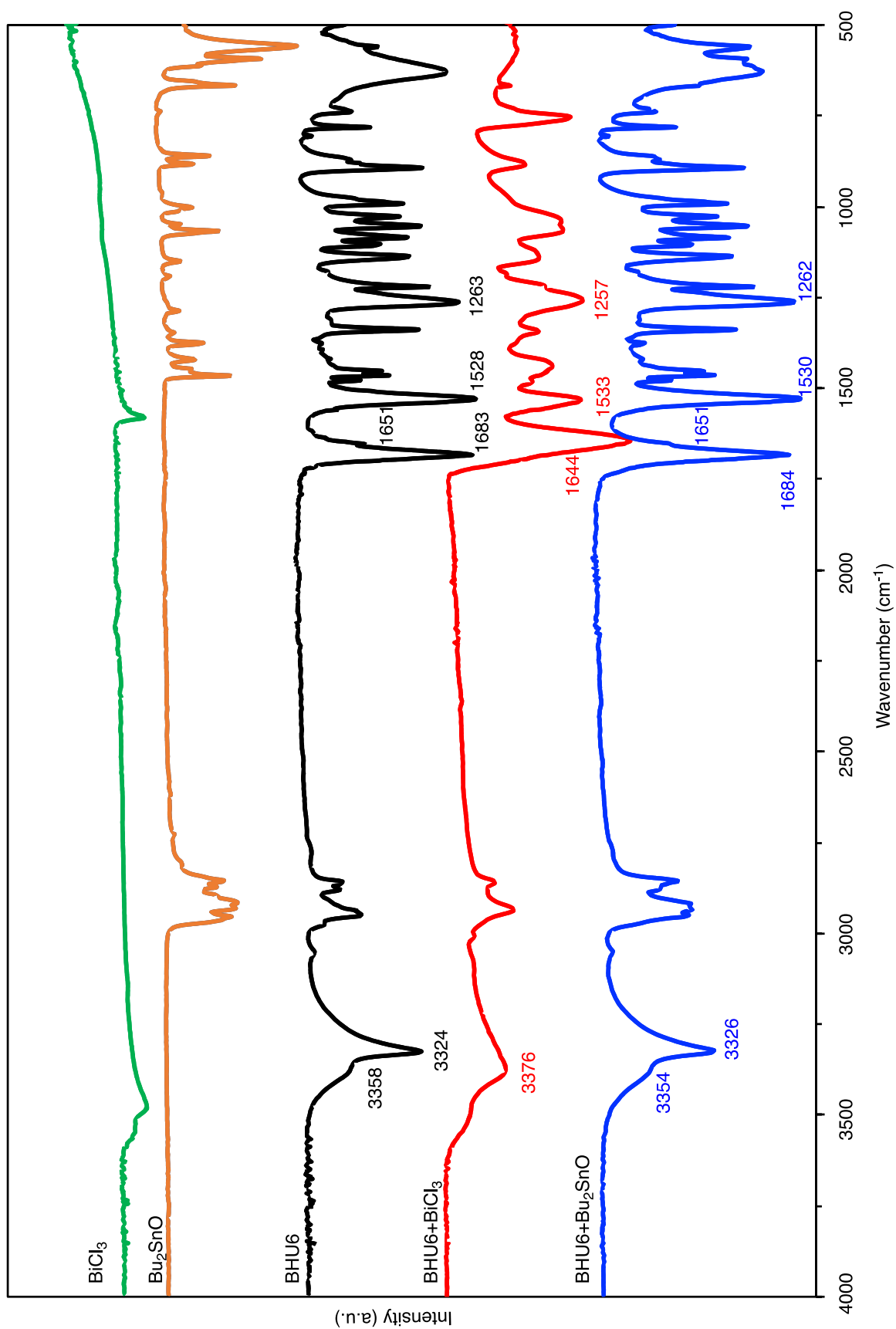
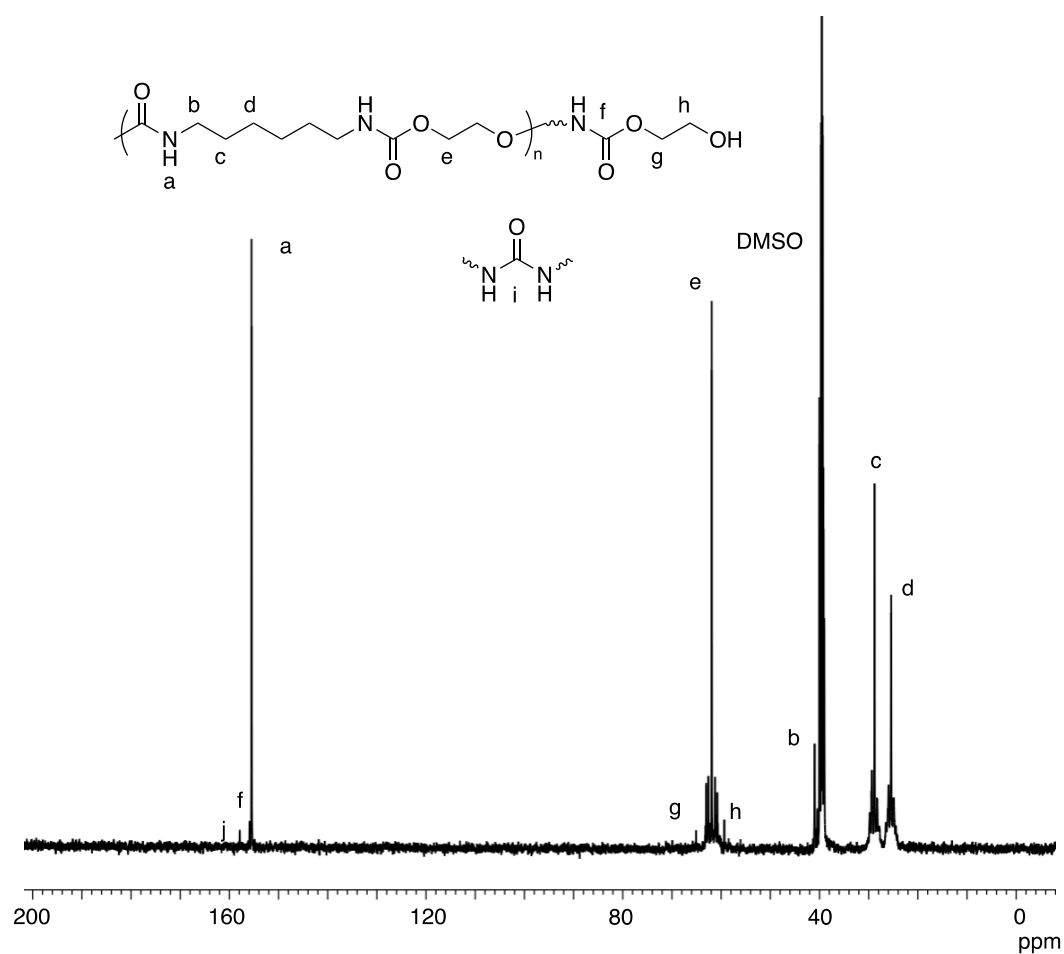
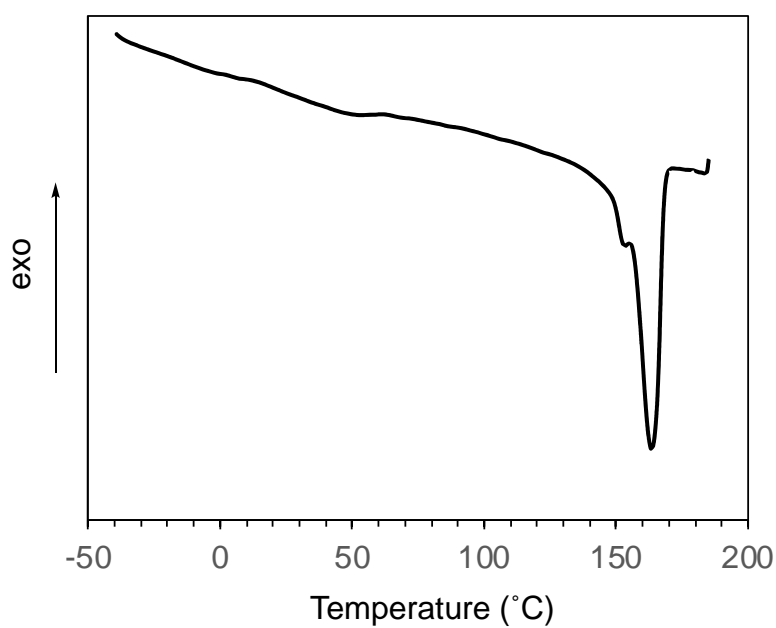


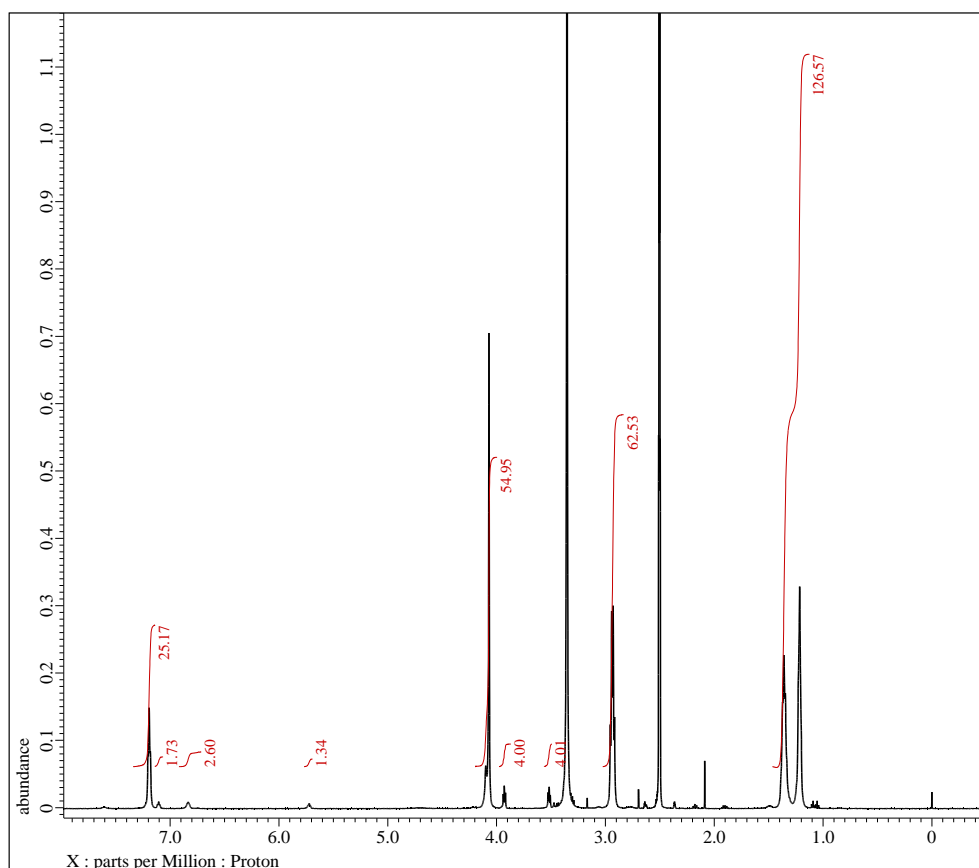
Figure S2. Full-range IR spectra for Figure 1.



**Figure S3.**  $^{13}\text{C}$  NMR spectrum of [6,2]-polyurethane obtained by self-condensation of BHU6 at 150 °C for 5 h in xylene using  $\text{BiCl}_3$  ( $d_6$ -DMSO, 125 MHz).



**Figure S4.** DSC curve of [6,2]-polyurethane (10 °C/min,  $\text{N}_2$ , second heating scan).



**Figure S5.**  $^1\text{H}$  NMR spectrum of [6,2]-polyurethane obtained in Entry 1 in Table 4..

Calculation of  $M_{n\text{NMR}}$

Molecular weight of unit = 230.26

Molecular weight of terminal group = 292.33

Degree of polymerization (–1):  $(62.53-4)/4 = 14.6$

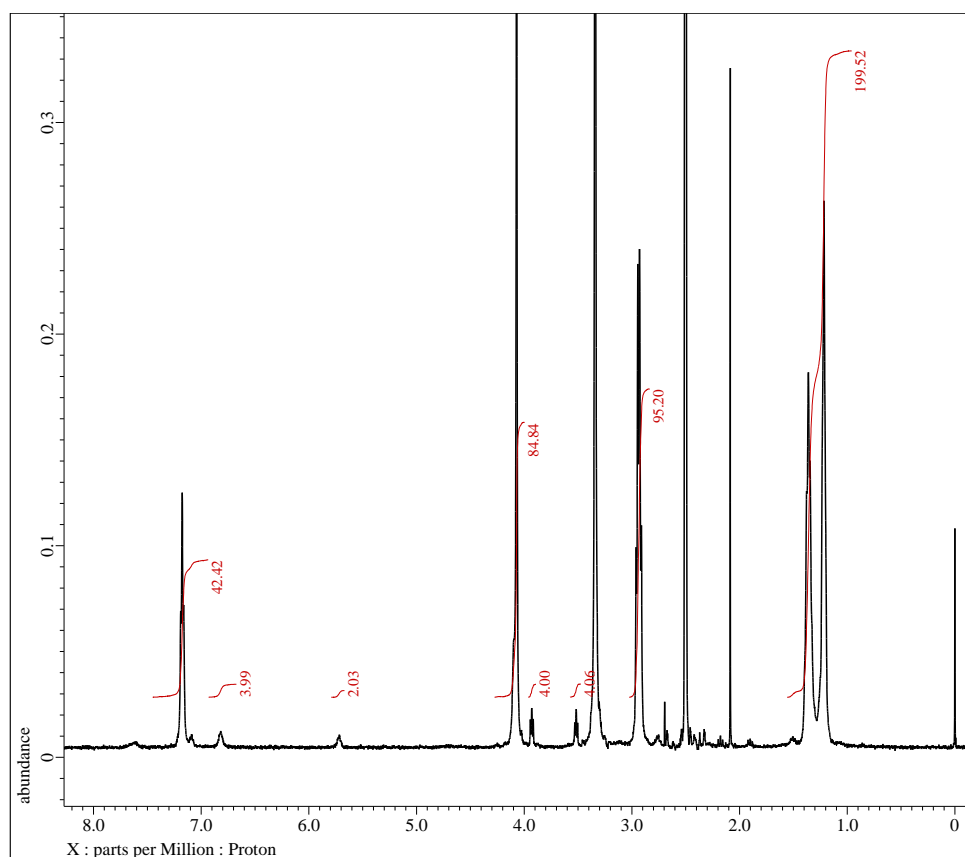
$M_{n\text{NMR}} = 230.26 \times 14.6 + 292.36 = 3661.6$

Calculation of Urethane/Urea ratio

Urea proton: 1.34

Urethane protons:  $25.17 + 1.73 + 2.60 = 29.5$

Urethane/Urea =  $96/4$



**Figure S6.**  $^1\text{H}$  NMR spectrum of [6,2]-polyurethane obtained in Entry 2 in Table 4.

Calculation of  $M_{\text{nNMR}}$

Degree of polymerization (–1):  $(95.20-4)/4 = 22.8$

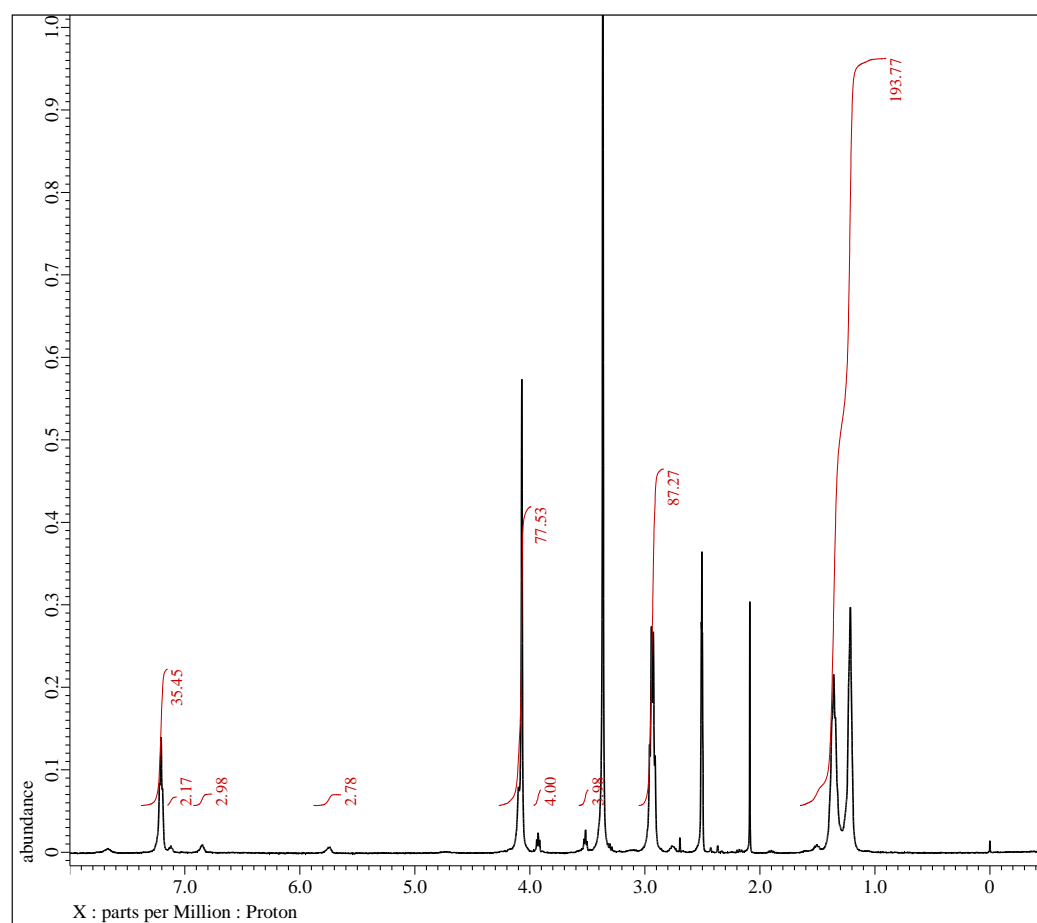
$M_{\text{nNMR}} = 230.26 \times 22.8 + 292.36 = 5542.3$

Calculation of Urethane/Urea ratio

Urea proton: 2.03

Urethane protons:  $42.42 + 3.99 = 46.41$

Urethane/Urea =  $96/4$



**Figure S7.**  $^1\text{H}$  NMR spectrum of [6,2]-polyurethane obtained in Entry 3 in Table 4.

Calculation of  $M_{\text{nNMR}}$

Degree of polymerization (–1):  $(87.27-4)/4 = 20.8$

$M_{\text{nNMR}} = 230.26 \times 20.8 + 292.36 = 5085.8$

Calculation of Urethane/Urea ratio

Urea proton: 2.78

Urethane protons:  $35.43 + 2.17 + 2.98 = 40.6$

Urethane/Urea =  $94/6$