

## Synthesis and Characterization of New Polyurea Elastomers by Sol-Gel Chemistry (Supporting Information)

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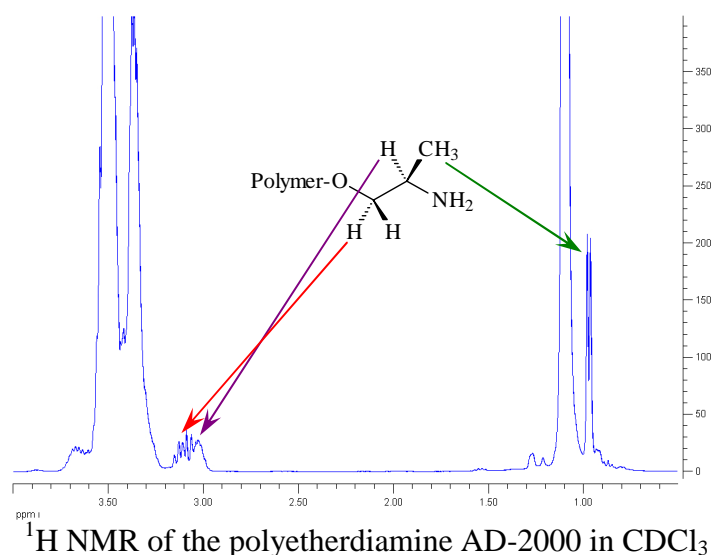
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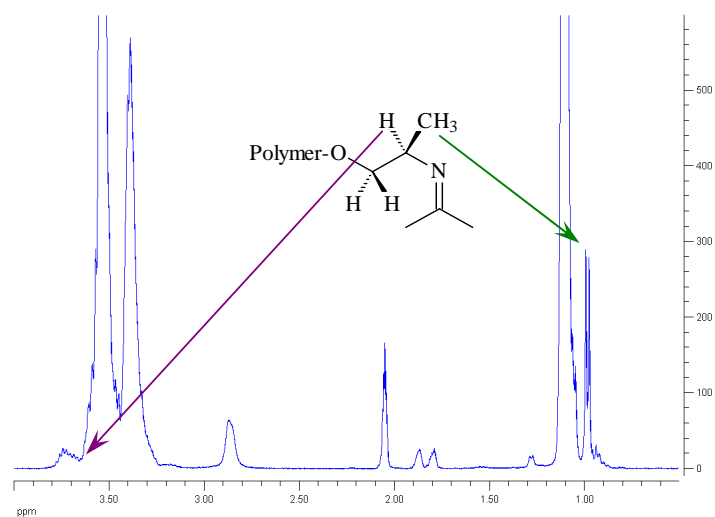
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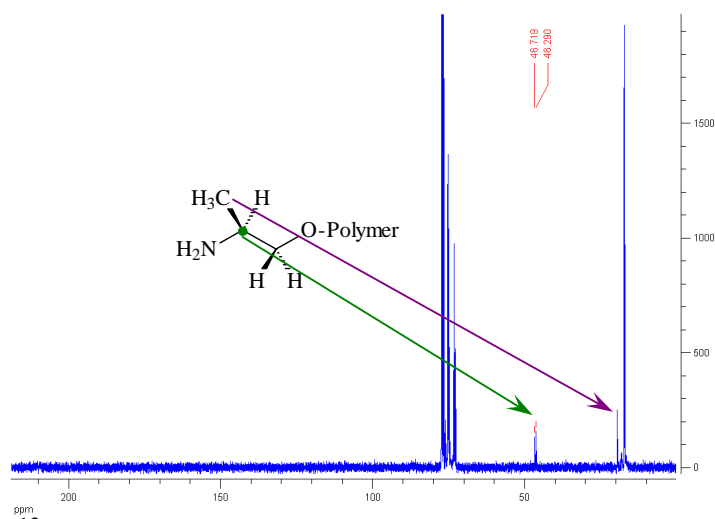
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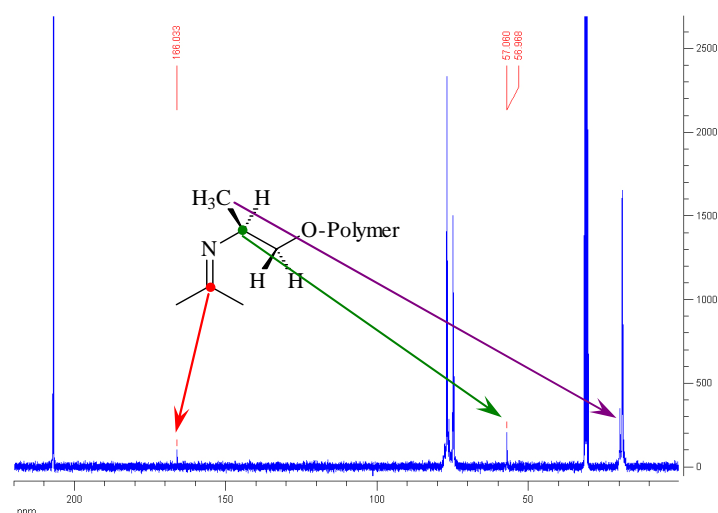




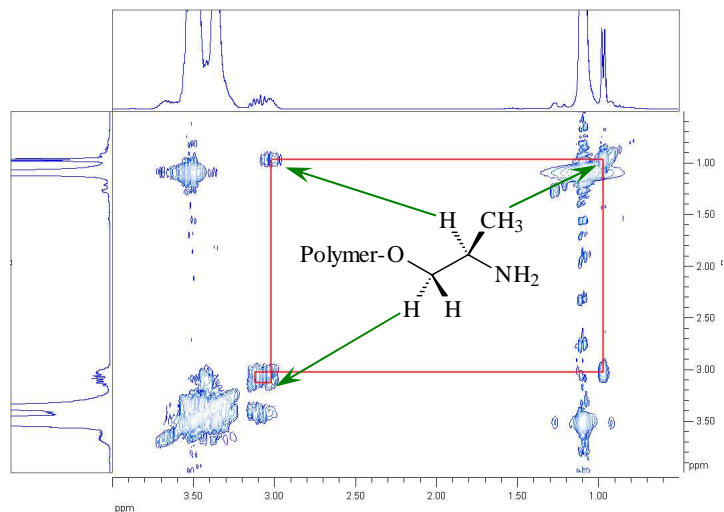
$^1\text{H}$  NMR of the polyetherdiamine AD-2000 in acetone- $d_6$



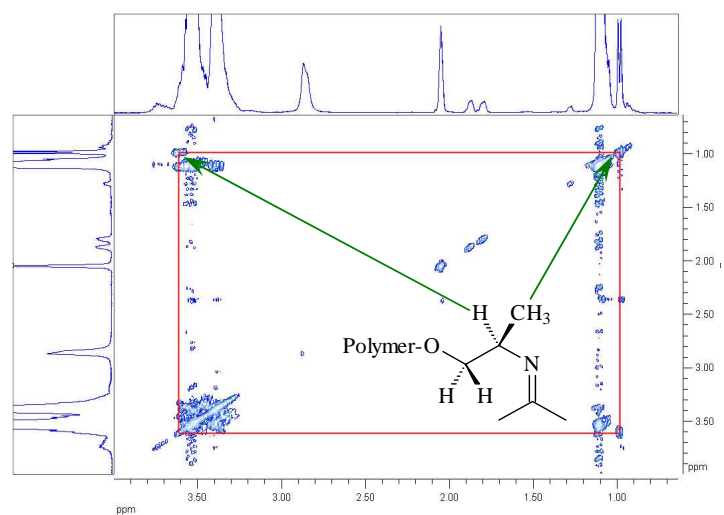
$^{13}\text{C}$  NMR of the polyetherdiamine AD-2000 in  $\text{CDCl}_3$



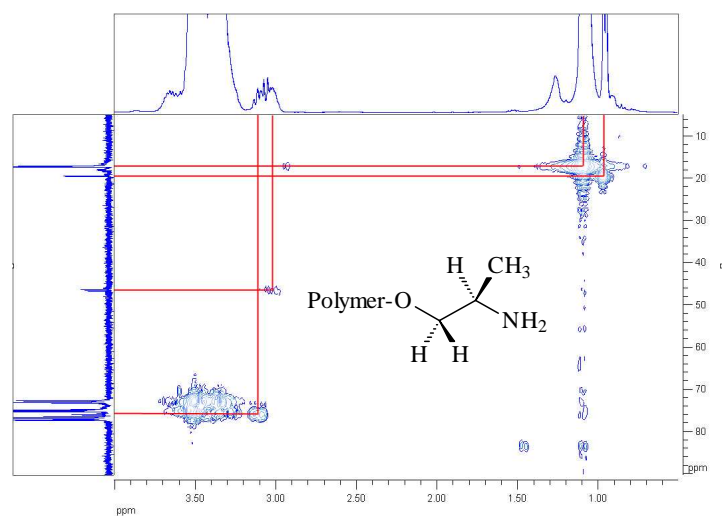
$^{13}\text{C}$  NMR of the polyetherdiamine AD-2000 in acetone- $d_6$



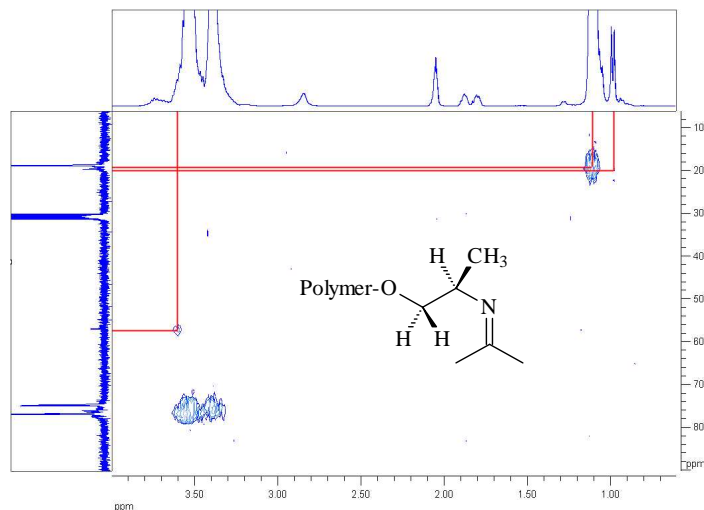
$^1\text{H}$ - $^1\text{H}$  NMR homocorrelation of the polyetherdiamine AD-2000 in  $\text{CDCl}_3$



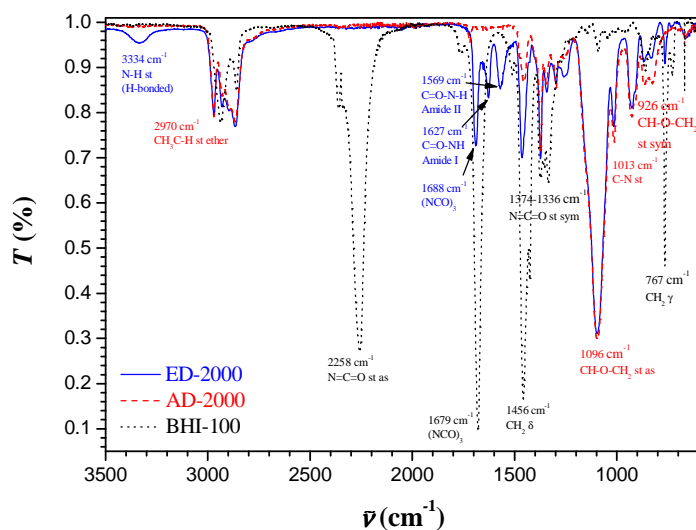
$^1\text{H}$ - $^1\text{H}$  NMR homocorrelation of the polyetherdiamine AD-2000 in  $\text{acetone-}d_6$



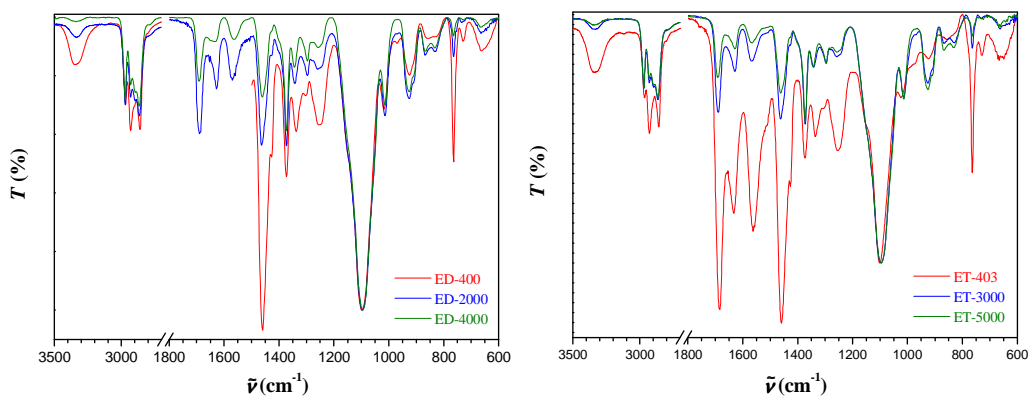
$^1\text{H}$ - $^{13}\text{C}$  NMR heterocorrelation of the polyetherdiamine AD-2000 in  $\text{CDCl}_3$



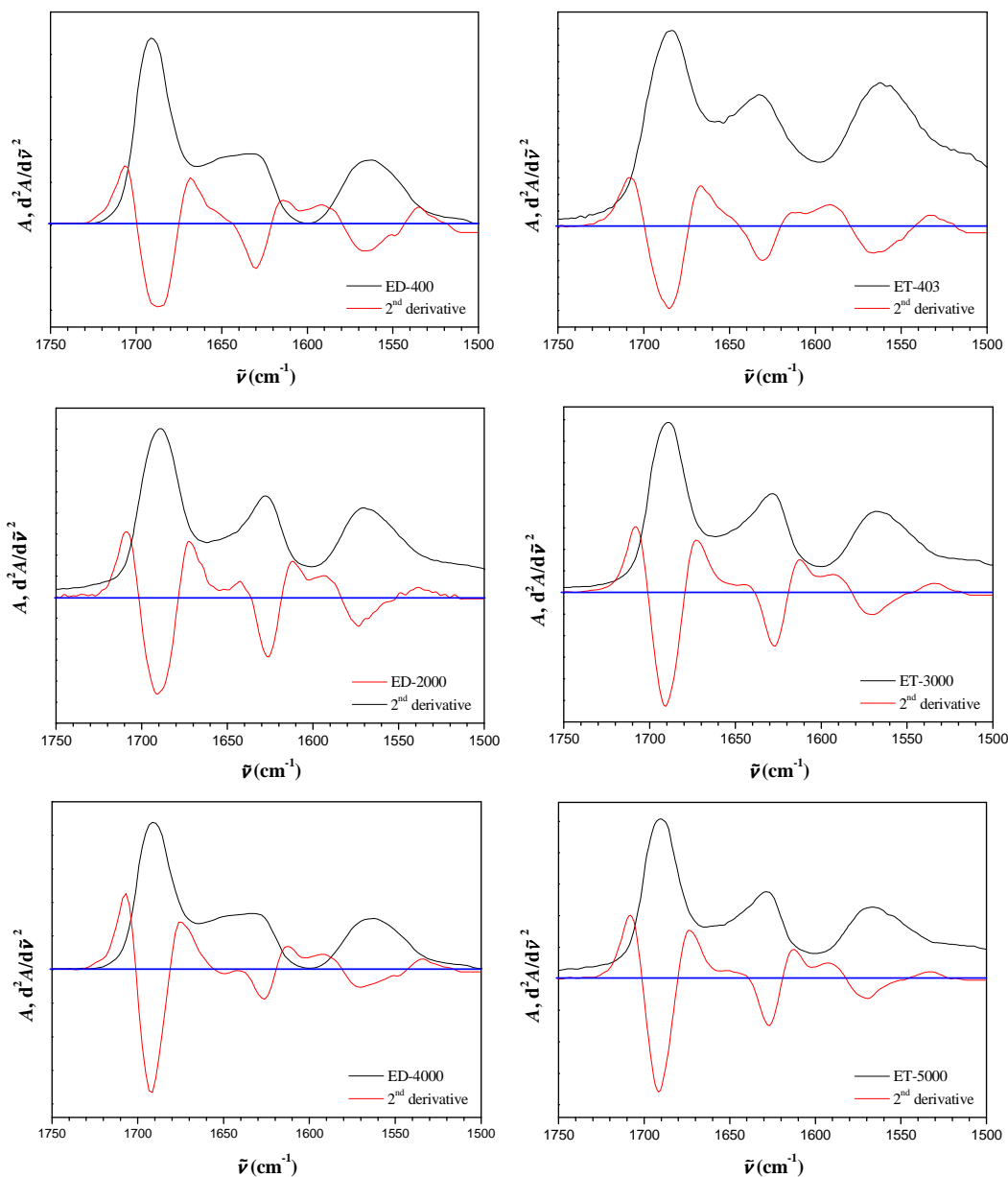
$^1\text{H}$ - $^{13}\text{C}$  NMR heterocorrelation of the polyetherdiamine AD-2000 in acetone- $d_6$



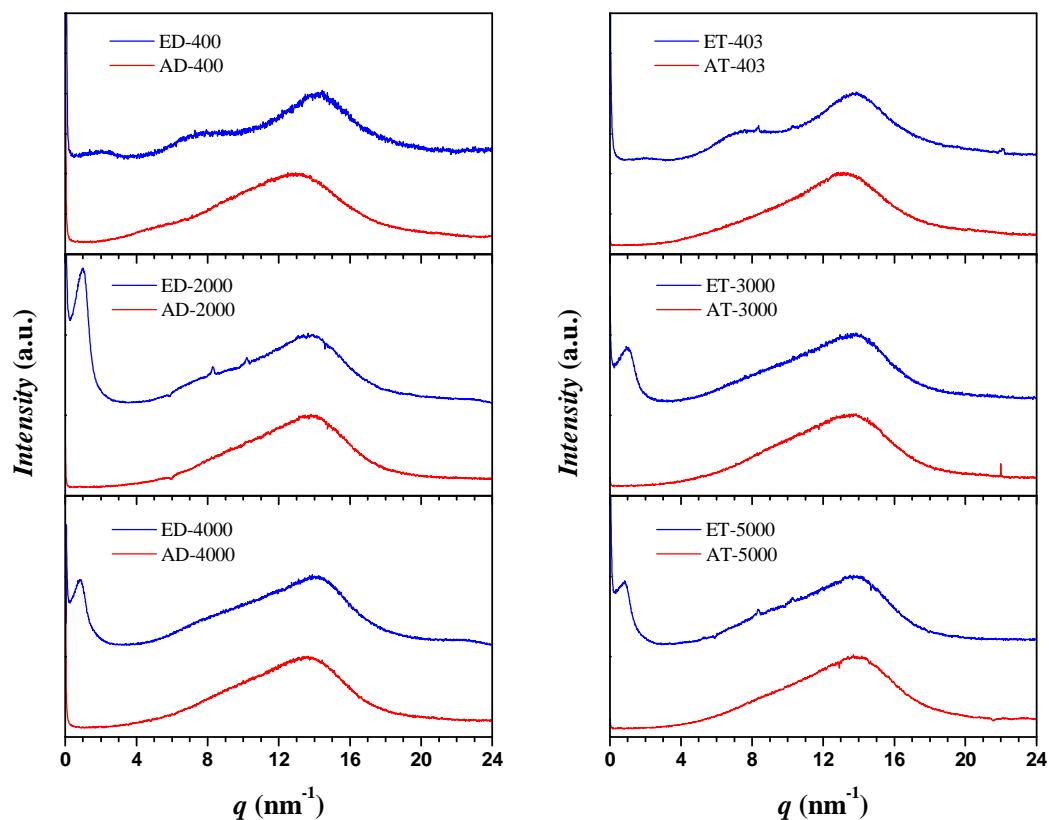
FTIR spectra of the polyetherdiamine AD-2000, the crosslinker BHI-100, and the corresponding elastomer ED-2000



FTIR spectra normalized to the peak at  $1096\text{ cm}^{-1}$  ( $\text{CH-O-CH}_2$  st as) of all polyetherurea elastomers



FTIR spectra of all polyetherurea elastomers and their corresponding 2<sup>nd</sup> derivatives in the carbonyl region ( $\tilde{\nu} \approx 1690 \text{ cm}^{-1}$ , isocyanurate ring;  $\tilde{\nu} \approx 1630 \text{ cm}^{-1}$ , C=O-NH Amide I;  $\tilde{\nu} \approx 1570 \text{ cm}^{-1}$ , Amide II)



Small and Wide Angle X-ray Scattering (SAXS and WAXS) curves of all polyetherurea elastomers (blue) and polyetheramines (red) at 25 °C

Glass transition temperature comparison between polyetheramines and their corresponding networks

Amine	$T_g$ (°C)	$\Delta C_p$ (J·g <sup>-1</sup> ·K <sup>-1</sup> )	Elastomer	$T_g$ (°C)	$\Delta C_p$ (J·g <sup>-1</sup> ·K <sup>-1</sup> )
AD-400	-85	0.82	ED-400	-5	0.31
AD-2000	-77	0.59	ED-2000	-65	0.50
AD-4000	-74	0.63	ED-4000	-71	0.37
AT-403	+10	0.68	ET-403	+10	0.34
AT-3000	-74	0.60	ET-3000	-60	0.52
AT-5000	-73	0.60	ET-5000	-67	0.52