Synthesis of glycidyl azide polymers (GAPs) via binary ionic liquid–water mixtures without catalysts

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Supporting Information

General Methods: The GAP synthesis was carried out in a 250 ml three-necked round bottom flask equipped with a thermometer, a reflux condenser, and a mechanical stirrer. The 30.00 g of PECH was dissolved in mixed solvents with a different mass ratio of [Bmim]Cl and distilled water and stirred. The solution was heated to 95°C in an oil bath, and then 21.09 g of sodium azide was rapidly added into the reaction mixture with continued stirring for 10 h at this temperature. The reaction was monitored with quantitative 13C-NMR. After the reaction finished, the mixtures were washed sequentially with distilled water more than 3 times until all salts were removed. The water was then evaporated to recover the products.

Table 1.

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<th>[bmim][Cl]/H2O a</th>
<th>PECH g</th>
<th>NaN3 g</th>
<th>Time h</th>
<th>T °C</th>
<th>Yield b</th>
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* a mass ratio

b Isolated yields

Fig. 1. 1H-NMR spectra of GAP and PECH.
Fig. 2. IR spectra of GAP1.

Fig. 3. $^{13}$C-NMR spectra of GAP1.

Fig. 4. IR spectra of GAP2.

Fig. 5. $^{13}$C-NMR spectra of GAP2.

Fig. 6. IR spectra of GAP3.

Fig. 7. $^{13}$C-NMR spectra of GAP3.
Fig. 8. IR spectra of GAP4.
Fig. 9. $^{13}$C-NMR spectra of GAP4.

Fig. 10. IR spectra of GAP5.
Fig. 11. $^{13}$C-NMR spectra of GAP5.

Fig. 12. IR spectra of GAP6.
Fig. 13. $^{13}$C-NMR spectra of GAP6.
Fig. 14. IR spectra of GAP7.

Fig. 15. $^{13}$C-NMR spectra of GAP7.

