

Figure S1: ^1H NMR spectra of (a) DES-ReHy12 and (b) DES-ReHy13.

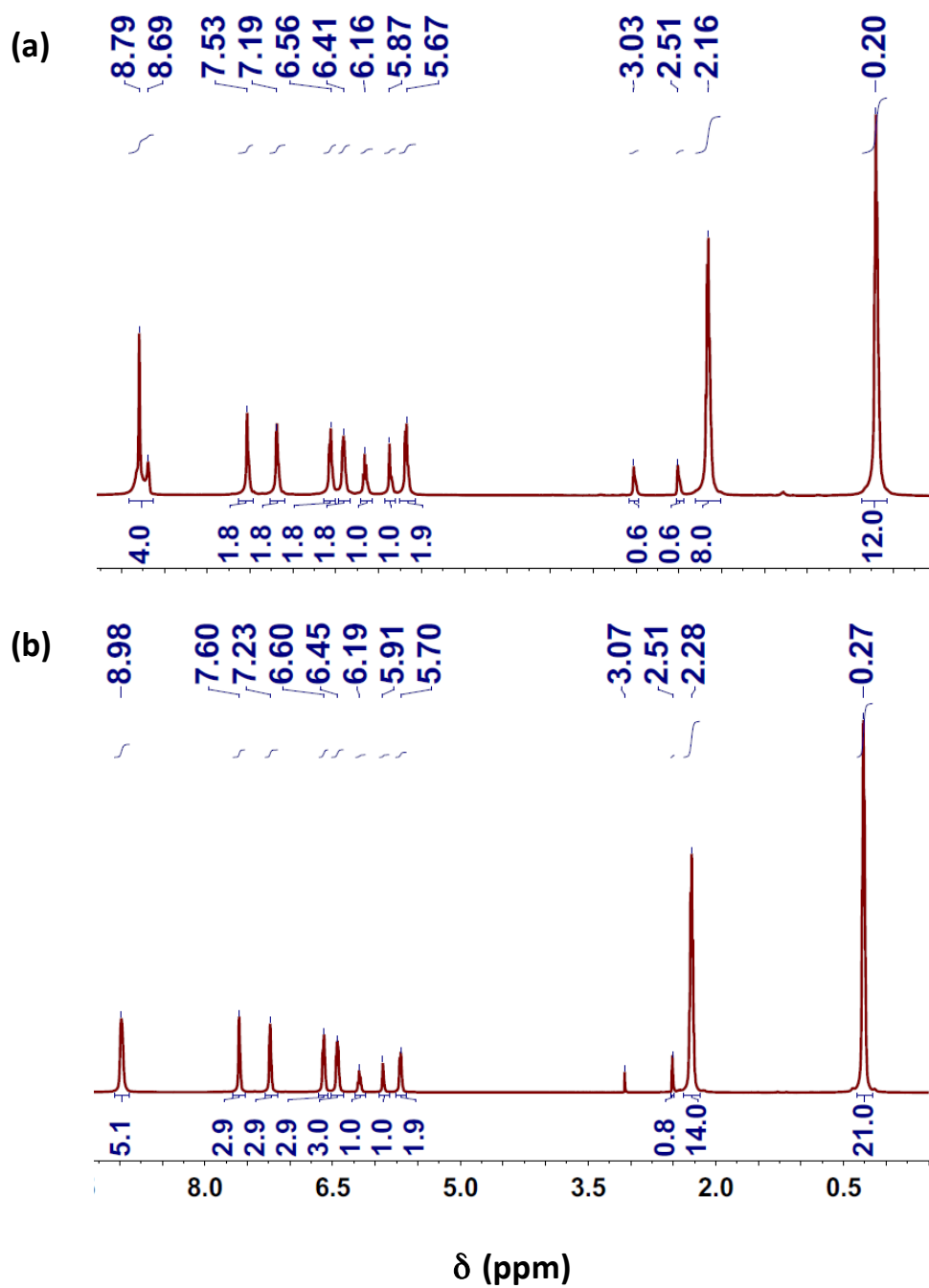


Figure S2: Solid ^{13}C NMR spectra of the product obtained after polycondensation of (a) DES-ReHy12 and (b) DES-ReHy13. The most interesting signals were those centered at about 53 ppm and 31 ppm (the latter, very broad and with a shoulder at 26 ppm), which are typically assigned to methylene ether and methylene groups (e.g., $\text{CH}_2\text{-O-CH}_2$ and CH_2 bridges, respectively). Different types of CH_2 bridges can be distinguished depending on the chemical shift.¹ Thus, the most common 4–4' methylene bridge has been typically assigned to signals at 30–38 ppm, and the less common 2–4' methylene bridges to signals at 22–30 ppm. The signal at 122 ppm was also interesting in terms of condensation since it corresponds to aromatic carbons of mono and disubstituted resorcinols bearing CH_2 groups in all ortho positions relative to the phenolic OHs. Non-substituted aromatic CH groups in meta positions appeared at 132 ppm.

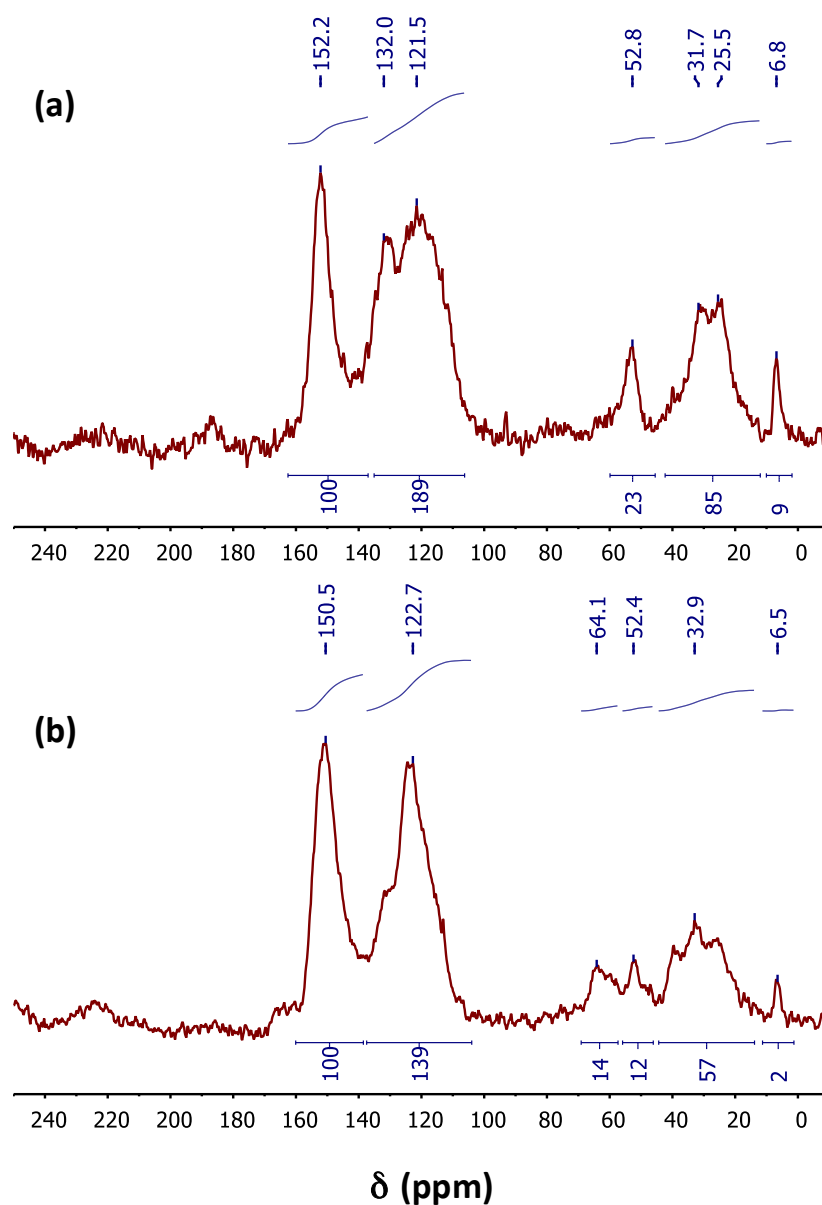


Figure S3: Fourier transform infrared (FTIR) spectra of the product obtained after polycondensation of DES-ReHy12 (black line) and DES-ReHy13 (grey line). The bands at 2925 and 1465 cm^{-1} in the FTIR spectra were assigned to methylene groups (associated with the CH_2 stretching and bending vibrations), whereas the broad band at 3388 cm^{-1} included the aromatic OH groups of resorcinol and hydroxypyridine.² The band at 1604 cm^{-1} came from aromatic ring stretches, whereas medium to weak absorption bands at 1230 and 1091 cm^{-1} corresponded to the C–O stretch and deformation of benzyl ether groups (methylene ether groups), respectively. The absorption band centered 1303 cm^{-1} was attributed to C–N single bond stretching vibrations.³

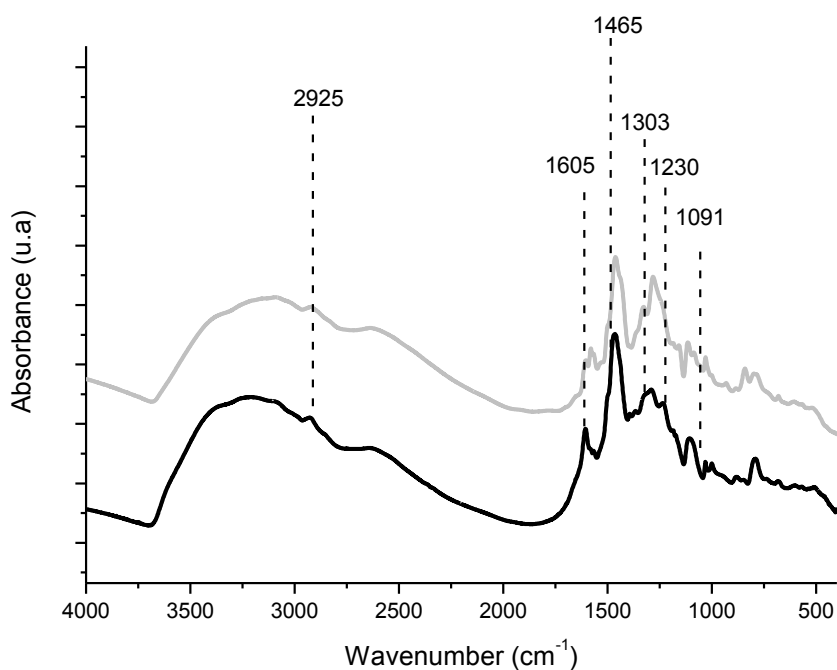


Table S1: Binding energies of C1s, N1s and O1s in XPS spectra.

	C1s	N1s	O1s
$C_{\text{ReHy12}}@800$	284.8 (60) 286.2 (31) 288.3 (9)	298.5 (24) 400.3 (30) 401.6 (39) 403.0 (7)	531.4 (28) 532.8 (72)
$C_{\text{ReHy12}}@700$	284.8 (63) 286.2 (27) 288.2 (10)	298.5 (33) 400.3 (25) 401.2 (33) 402.7 (9)	531.2 (33) 532.8 (67)
$C_{\text{ReHy12}}@600$	284.8 (67) 286.2 (25) 288.2 (8)	298.7 (42) 400.5 (36) 401.4 (12) 402.5 (10)	531.2 (33) 532.9 (67)
$C_{\text{ReHy12}}@500$	284.8 (61) 286.1 (30) 288.0 (9)	298.5 (41) 400.2 (32) 401.3 (18) 402.8 (9)	531.2 (34) 533.0 (66)
$C_{\text{ReHy13}}@800$	284.8 (68) 286.2 (24) 288.1 (8)	398.5 (29) 400.5 (30) 401.5 (34) 402.8 (7)	531.1 (34) 532.6 (66)
$C_{\text{ReHy13}}@700$	284.8 (67) 286.2 (24) 288.0 (9)	398.5 (34) 400.6 (41) 402.5 (16) 402.6 (9)	531.2 (32) 532.7 (68)
$C_{\text{ReHy13}}@600$	284.8 (71) 286.2 (22) 288.1 (7)	398.6 (36) 400.5 (37) 401.5 (18) 403.1 (10)	531.1 (27) 532.6 (73)
$C_{\text{ReHy13}}@500$	284.8 (67) 286.2 (26) 288.2 (7)	398.5 (42) 400.3 (34) 401.3 (16) 402.6 (8)	531.1 (33) 532.6 (77)

¹ (a) R. L. Ward and R. W. Pekala, *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)*, 1990, 31, 167–169; (b) I. L. Moudrakovski, C. I. Ratcliffe, J. A. Ripmeester, L.-Q. Wang, G. J. Exarhos, T. F. Baumann and J. H. Satcher, *J. Phys. Chem. B*, 2005, 109, 11215–11222; (c) S. Mulik, C. Sotiriou-Leventis and N. Leventis, *Chem. Mater.*, 2007, 19, 6138–6144.

² Y. Chen, Z. Chen, S. Xiao and H. Liu, *Thermochim. Acta*, 2008, 476, 39–43.

³ (a) N. Liu, L. Yin, C. Wang, L. Zhang, N. Lun, D. Xiang, Y. Qi and R. Gao, *Carbon*, 2010, 48, 3579–3591; (b) Y. Qiu and L. Gao, *Chem. Commun.*, 2003, 2378–2379; (c) D. C. Nesting and J. V. Badding, *Chem. Mater.*, 1996, 8, 1535.