Supporting Information

High Yields of Solid Carbonaceous Materials from Biomass

Xun Hu†, Keigo Nango, Lei Bao, Tingting Li, MD Mahmudul Hasan, Chun-Zhu Li*

Fuels and Energy Technology Institute, Curtin University of Technology,
GPO Box U1987, Perth, WA 6845, Australia

*Corresponding author. Tel: (+) 61 8 9266 1131; Fax: (+) 61 8 9266 1138;
E-mail: chun-zhu.li@curtin.edu.au

Figure S1 Yields of the solid, liquid and pasty products from the thermal treatment of bio-oil/furfural/biochar at different reaction temperature and different reaction time. “250°C-0 min” meant when the temperature of the reactor reached 250°C in 45 min, the reactor was taken out of the sand bath.
Figure S2 Color of the extracted solution and the weight loss after the extraction of the carbon materials produced from 250°C at different reaction time. 0.30 g polymer was immersed into 6 g of methanol/chloroform and stirred, filtered, dried and weighted.
Figure S3 Constant energy (~2800 cm$^{-1}$) synchronous spectra for the extractives from the extraction of the polymers from the thermal treatment of bio-oil/furfural/biochar, bio-oil/furfural or bio-oil/biochar.
Figure S4 SEM images of biochar and the polymer produced from bio-oil/furfural/biochar.
Figure S5 SEM images of the polymer produced from bio-oil/furfural and the carbonised polymer.
Figure S6 SEM images of the coke produced via carbonisation of the polymer produced from bio-oil/furfural/biochar.
Figure S7 TGA characterisation of the polymers produced from polymerisation of bio-oil, furfural and/or biochar at (a) different reaction temperature; (b) different reaction time at 250°C; (c) different furfural content at 250°C; (d) different formulation of the reactants at the temperature of 250°C. The samples were not dried and characterized directly in TG as obtained from the polymerisation experiments.
**Figure S8** DTG curves of the carbon materials produced from polymerisation of bio-oil, furfural and/or biochar at (a) different reaction temperature; (b) different reaction time at 250°C; (c) different furfural content at 250°C; (d) different formulation of the reactants at the temperature of 250°C. TGA curves were depicted in Figure 6 in the paper.
Figure S9 TGA characterization of the polymer produced from the polymerisation of bio-oil with the different polymerisation agents at 250°C for 120 min.