

# Combining steam distillation with microwave-assisted pyrolysis to maximise direct production of levoglucosenone from agricultural wastes

Florent P. Bouxin, James H. Clark, Jiajun Fan\* and Vitaliy Budarin\*

Green Chemistry Centre of Excellence, Department of Chemistry, University of York, York, YO10 5DD, U.K

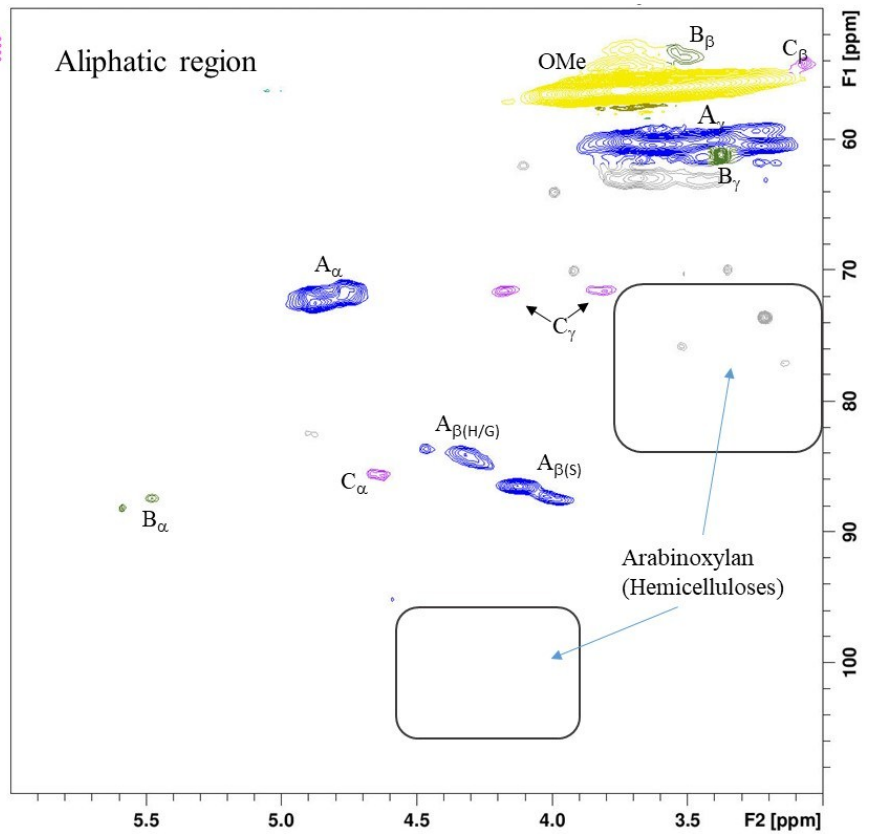
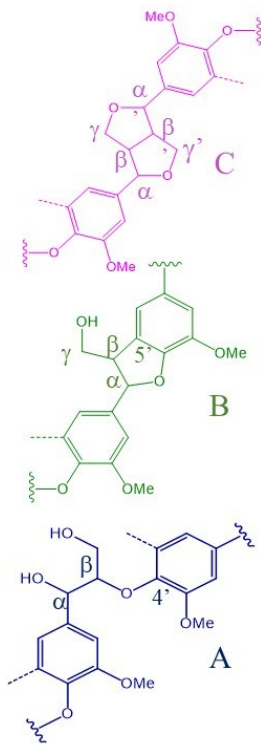
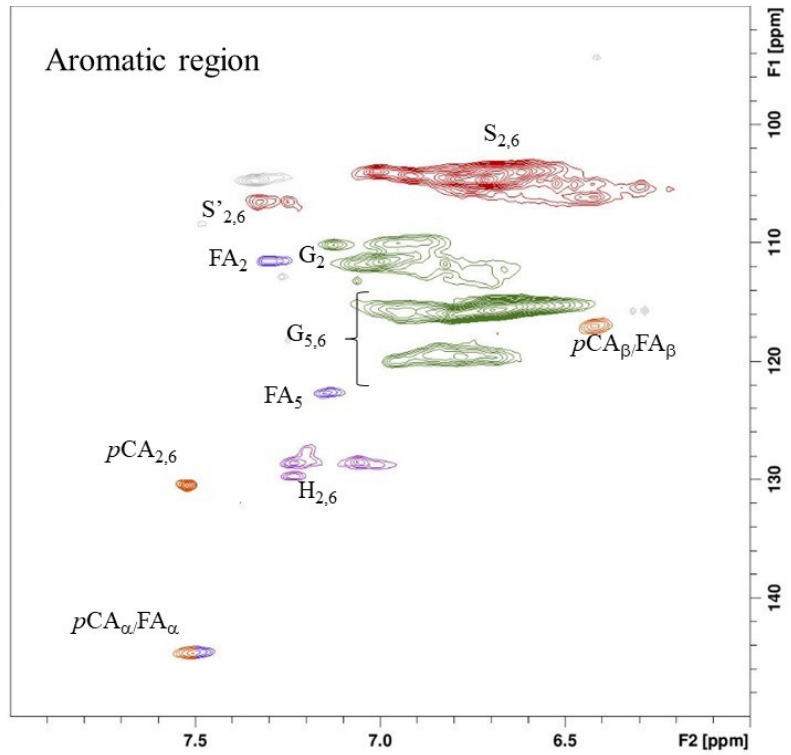
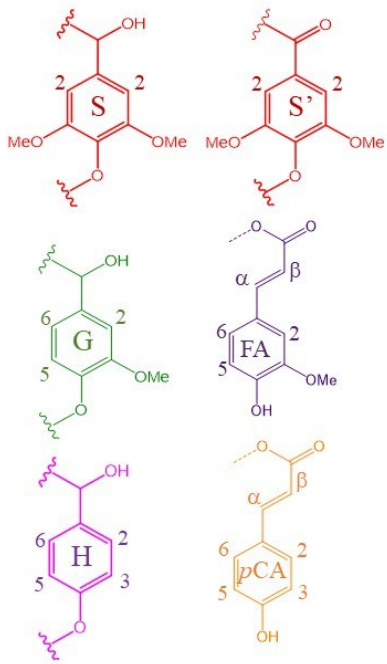


Fig S.1. 2D HSQC NMR (aliphatic and aromatic region) of alkali lignin from hemicellulose-depleted barley straw [S: Syringyl units; G: Guaiacyl units; H: Hydroxycinnamyl units; pCA: p-coumaric aci; FA: ferulic acid]

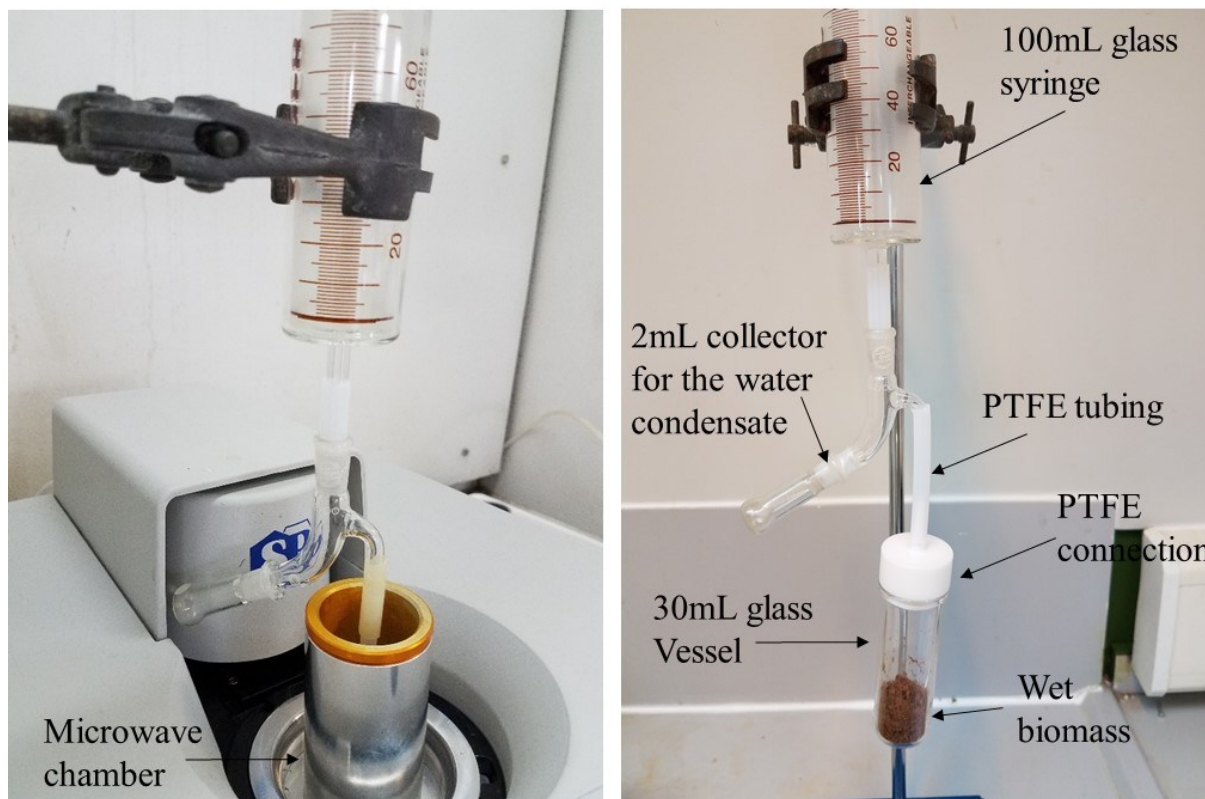


Fig. S.2. Pyrolysis/Steam distillation device mounted on the Microwave reactor CEM discovery SP

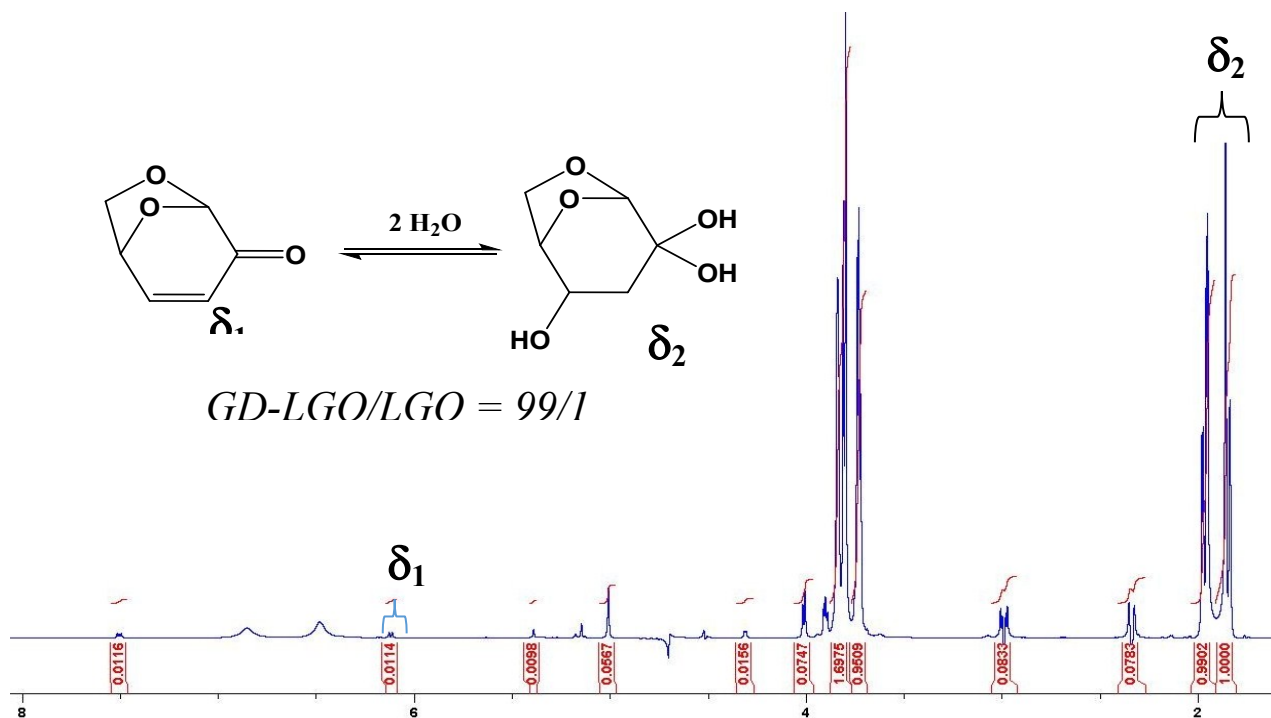


Fig. S.3. Equilibrium state molar ratio between germinal diol form of LGO (GD-LGO) and LGO obtained from  $^1\text{H}$  NMR of analysis of LGO in water (2g/L)