Electronic Supplementary Material (ESI) for Green Chemistry.

Supporting Information

Upgrading biomass-derived furans via acid-catalysis/hydrogenation: The remarkable difference between water and methanol as the solvent

Xun Hu, Roel J. M. Westerhof, Liping Wu, Dehua Dong, Chun-Zhu Li*

Fuels and Energy Technology Institute, Curtin University of Technology,

GPO Box U1987, Perth, WA 6845, Australia

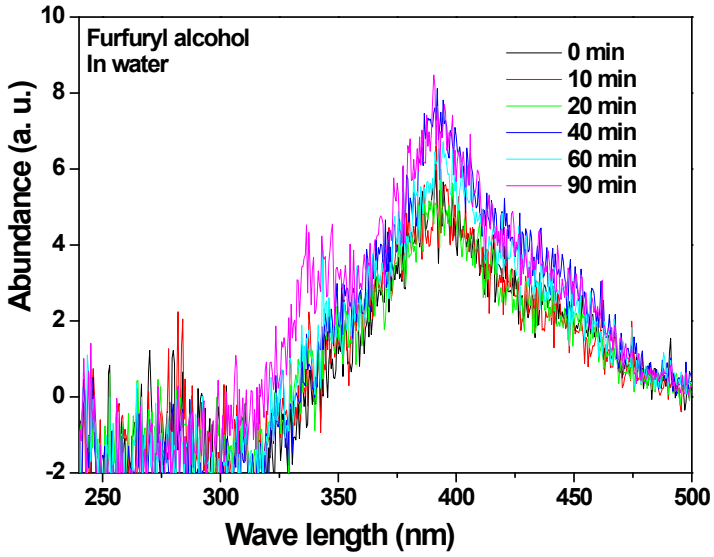

Figure 1 UV-fluorescence spectra for determination of the soluble polymer formed in acid-treatment of furfuryl alcohol in water: "0 min" means the reaction temperature just reached 130°C.

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

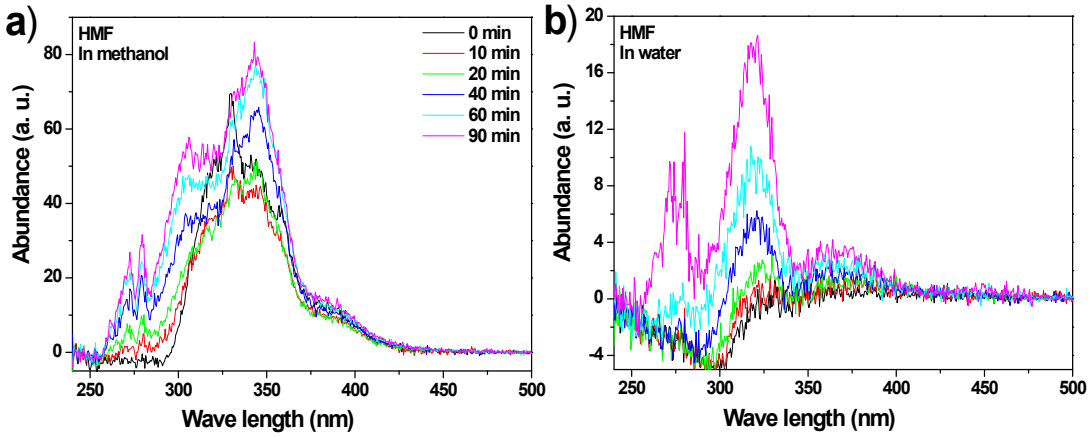

Figure S2 UV-fluorescence spectra for determination of the soluble polymer formed in acid-treatment of HMF in methanol and in water. It needs to be noted that the higher abundance of the soluble polymer in methanol is due to the higher solubility of the soluble polymer in methanol.

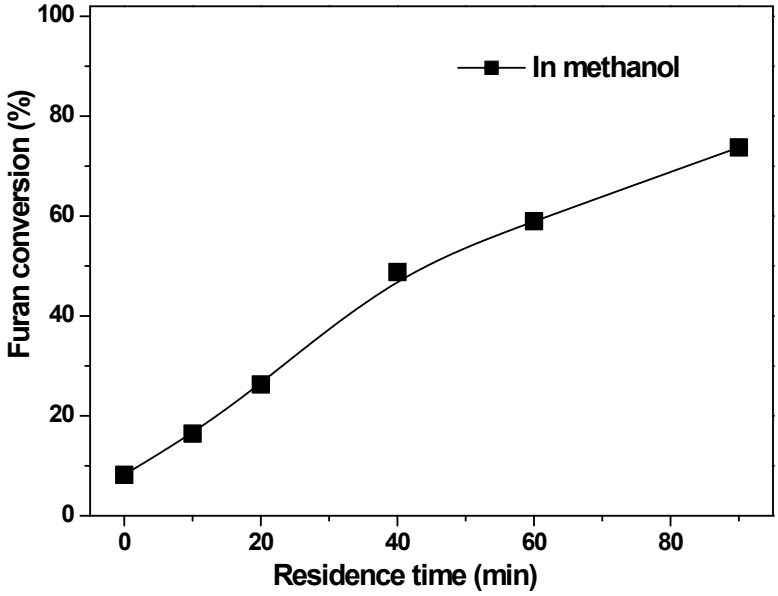

Figure S3 Conversion of furan in its acid-catalyzed conversion in methanol. Reaction conditions: furan loaded: 3 g, Amberlyst 70: 3 g, methanol: 100 ml, T = 170°C, residence time: 90 min. The conversion of furan in water was not presented as the low solubility of furan in water makes it difficult to get the accurate conversion data.

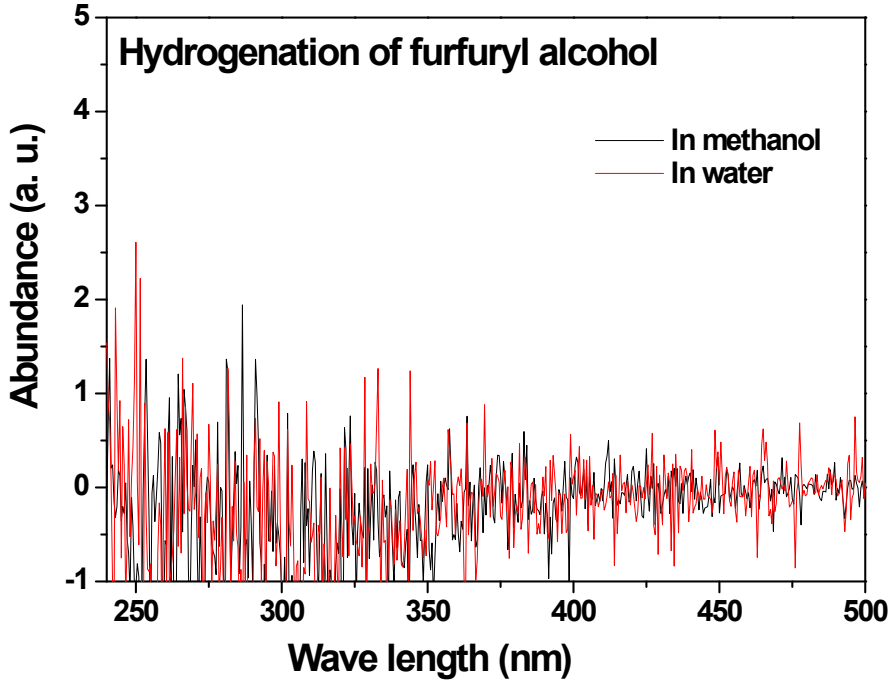

Figure S4 UV-fluorescence spectra for determination of the soluble polymer formed in hydrogenation of furfuryl alcohol in methanol and in water.

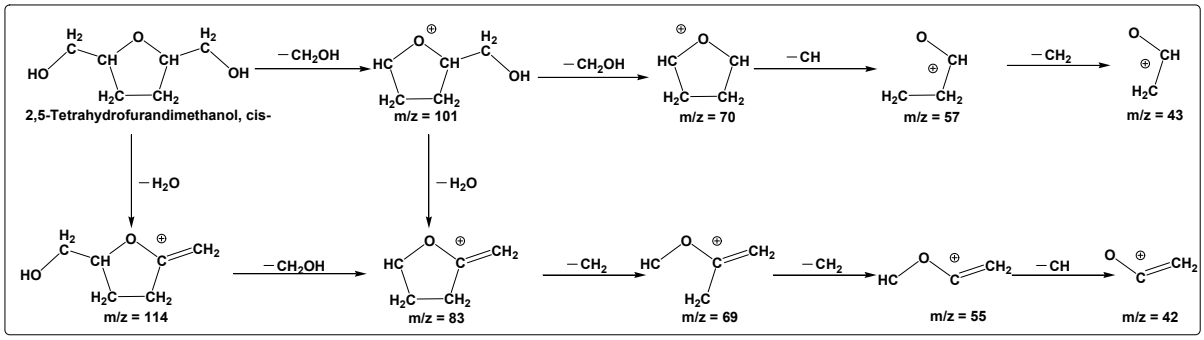

Figure S5 Proposed reaction pathways for the degradation of cis-2,5-tetrahydrofurandimethanol (TFM) in GC-MS.

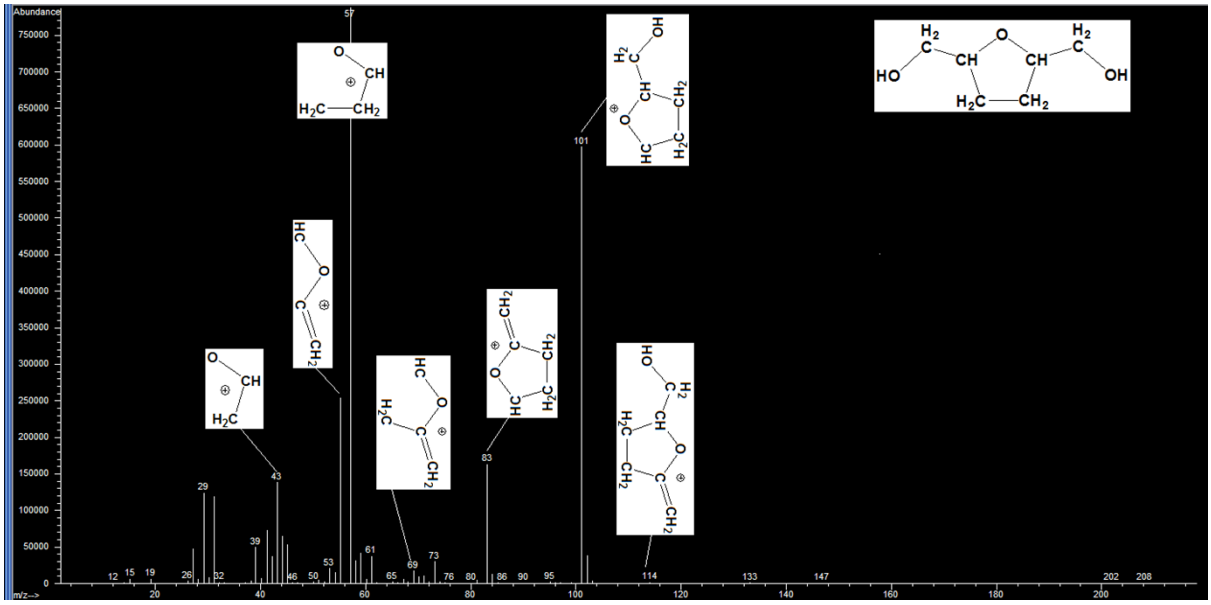

Figure S6 MS spectrum for cis-2,5-tetrahydrofurandimethanol (TFM).

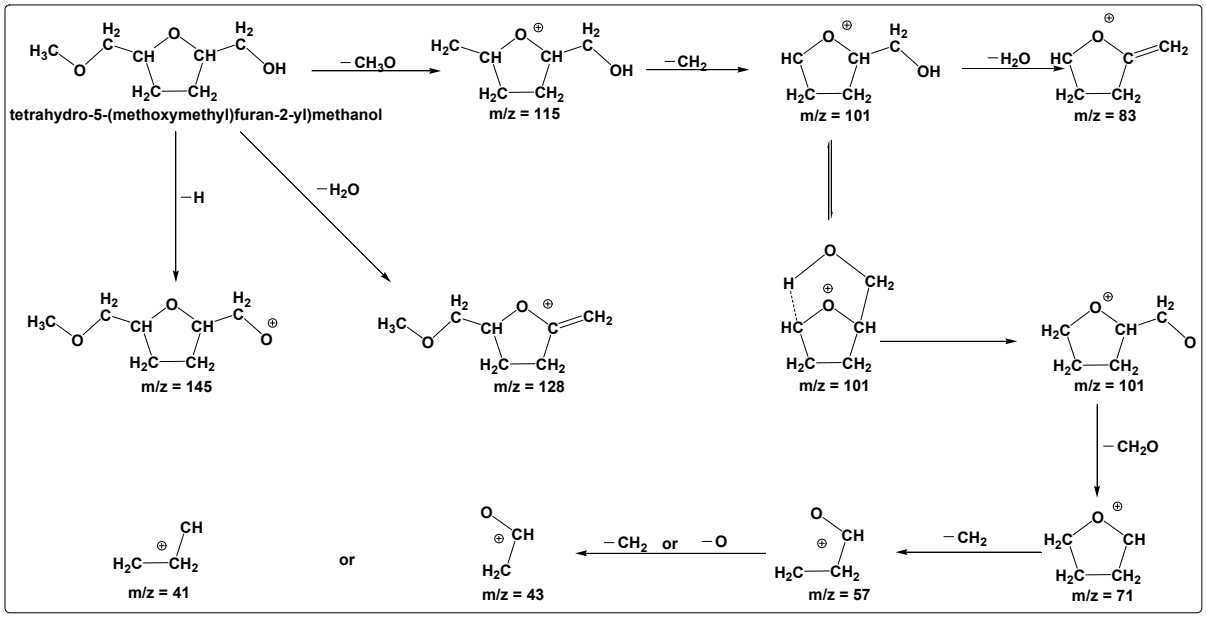

Figure S7 Proposed reaction pathways for the degradation of tetrahydro-5-(methoxymethyl)furan-2-yl)methanol (THFM).

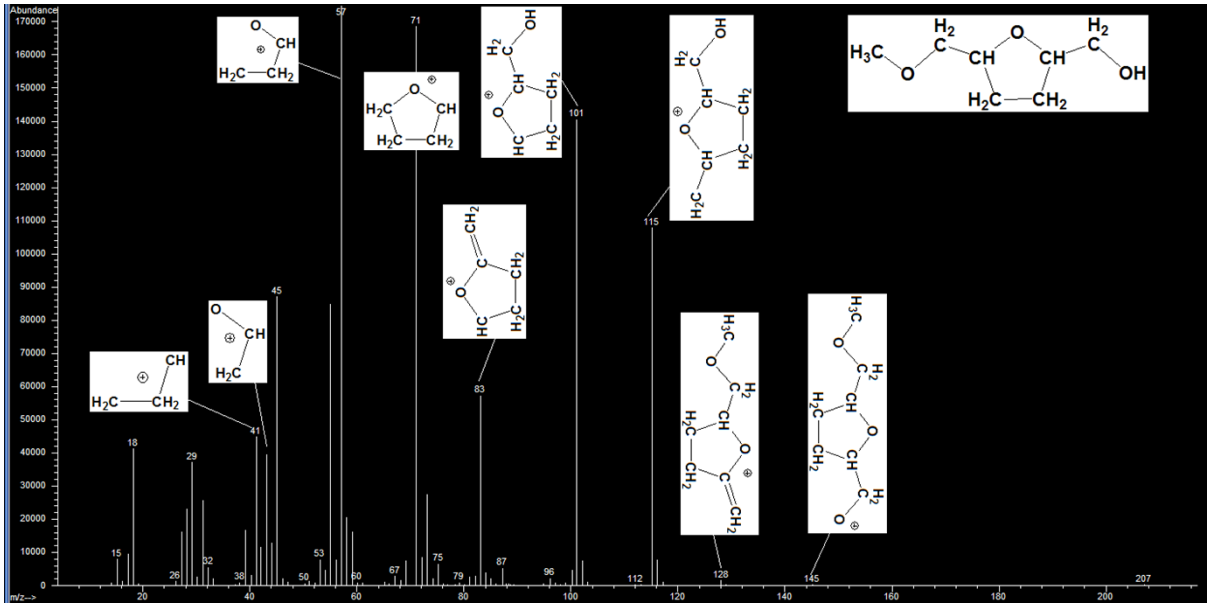

Figure S8 MS spectrum for tetrahydro-5-(methoxymethyl)furan-2-yl)methanol (THFM).

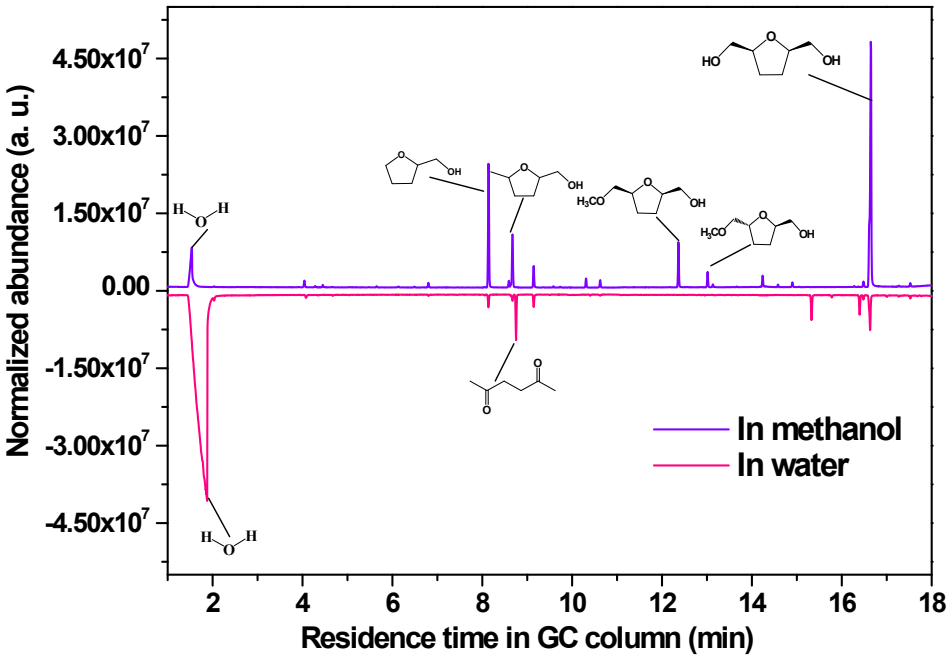

Figure S9 Normalized GC-MS spectra for the hydrogenation of HMF in methanol and water.

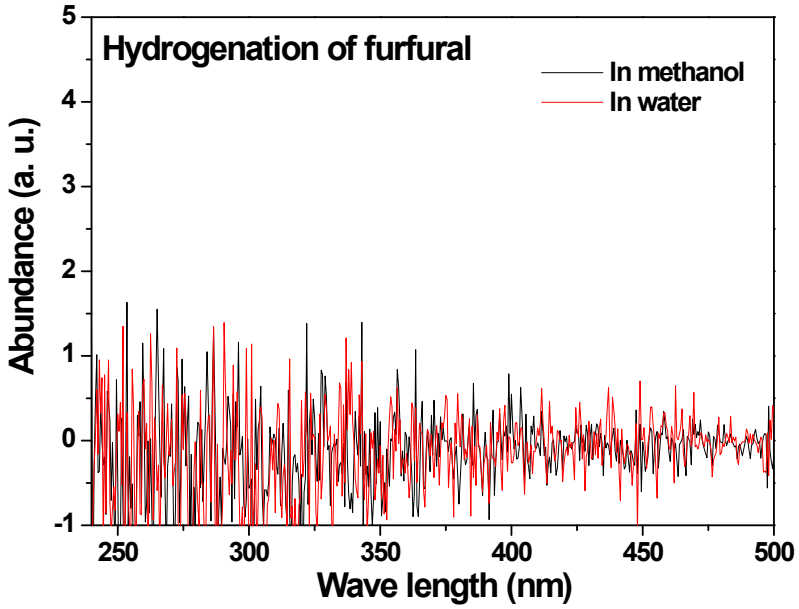

Figure S10 UV-fluorescence spectra for determination of the soluble polymer formed in hydrogenation of furfuryl alcohol in methanol and in water.