Supporting File

Efficient utilization of potash alum as a green catalyst for production of furfural, 5-hydroxymethylfurfural and levulinic acid from mono-sugars

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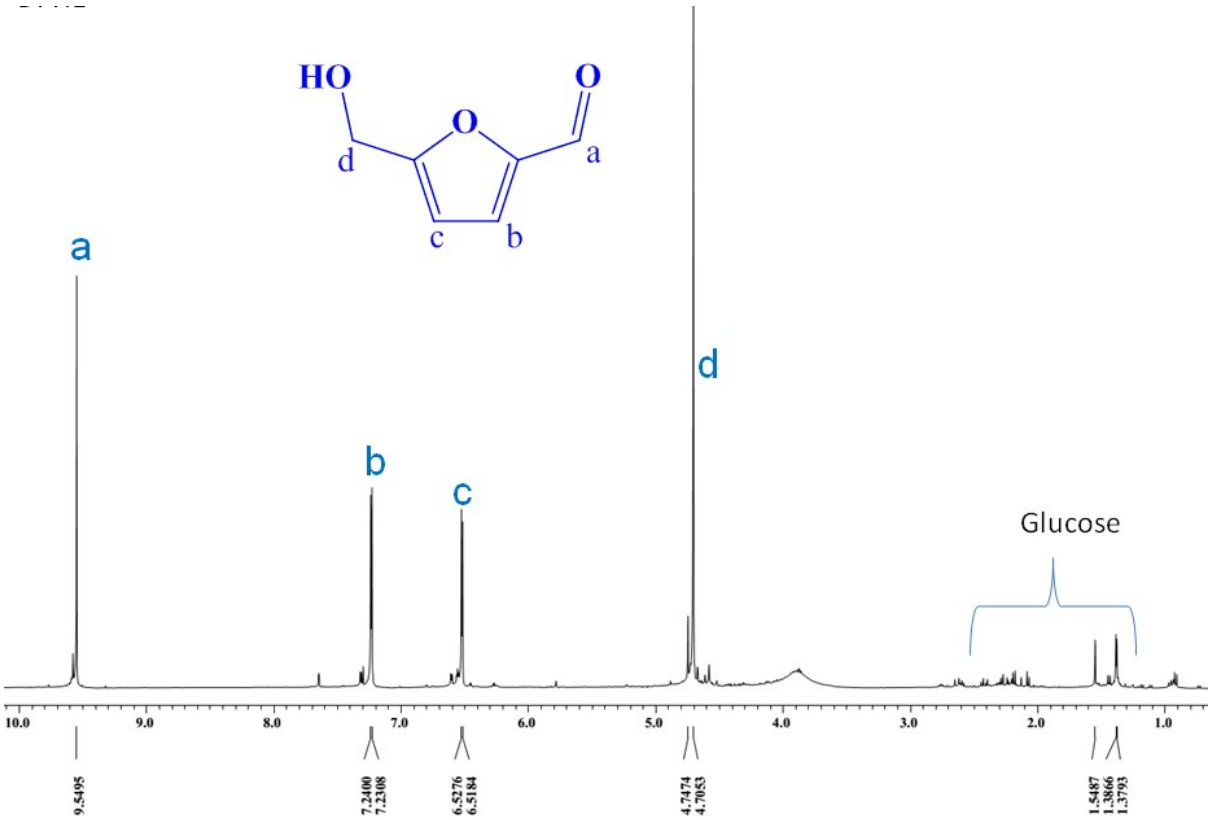

Figure S1: ^{1}H-NMR of HMF from glucose in $CDCl_3$. Reaction condition: Glucose =10 mmol, PA =1.2 mmol, solvent =10 mL (Water +MIBK 1:4) at 140 °C

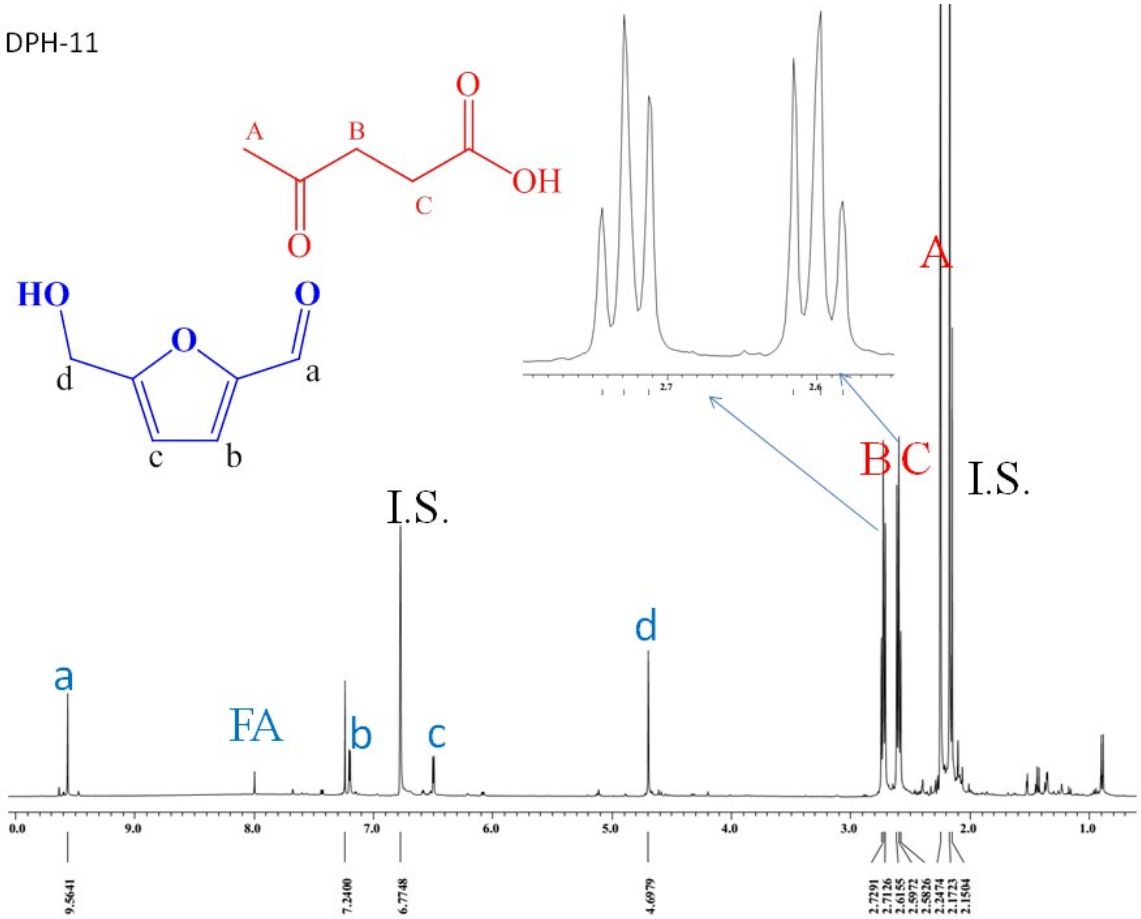

Figure S2: ^{1}H NMR of one-pot synthesis of HMF and LA from glucose, close view, show two triplets and one singlet characteristic pick of LA in $CDCl_3$.. Other reaction condition: Glucose =1o mmol, PA =1.2mmol, t=6 h, solvents= 10 mL, (1:4Water +MIBK). 180 °C

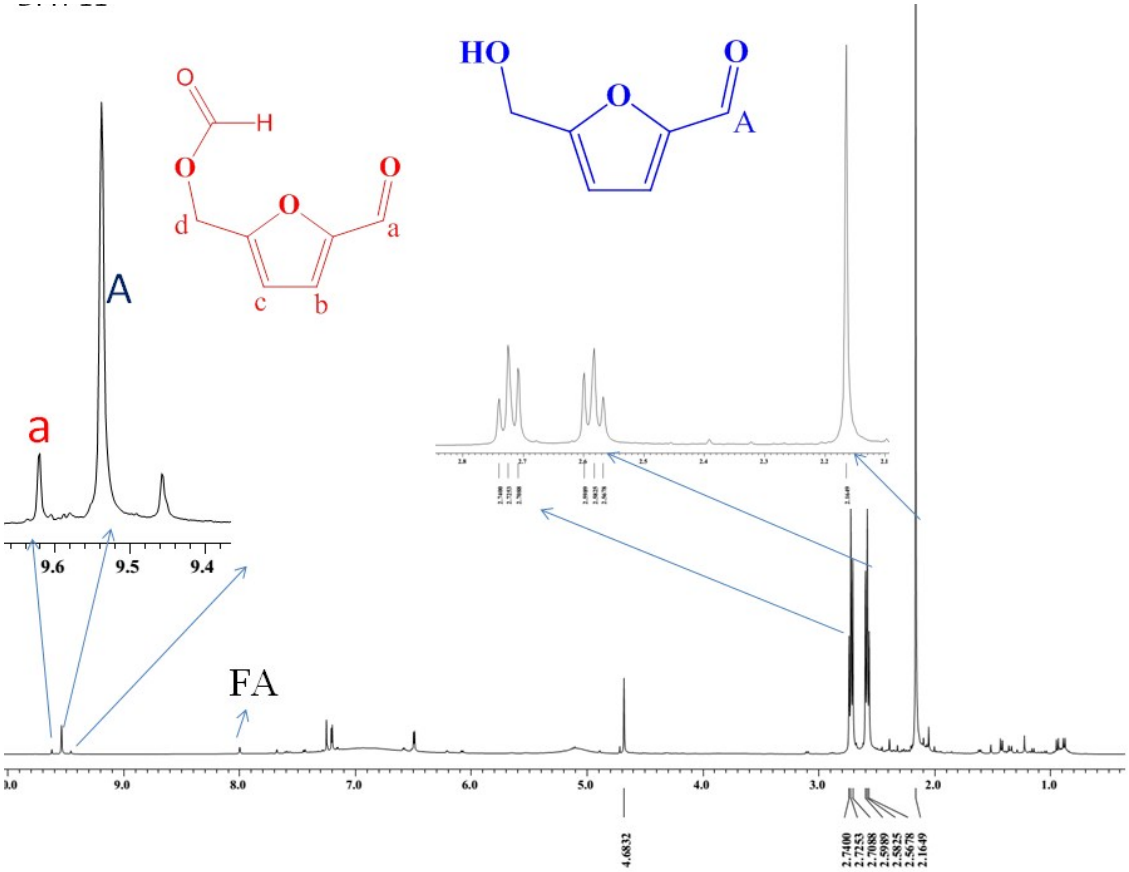

Figure S3: ^{1}H NMR of one-pot synthesis of HMF and LA from glucose, close view, show two triplets and one singlet characteristic pick of LA in $CDCl_3$ and formylation of HMF in presence of formic acid as by product. Other reaction condition: Glucose =10 mmol, PA =1.2 mmol, t=6 h, solvents= 10 mL, (1:4Water +MIBK). 180 °C

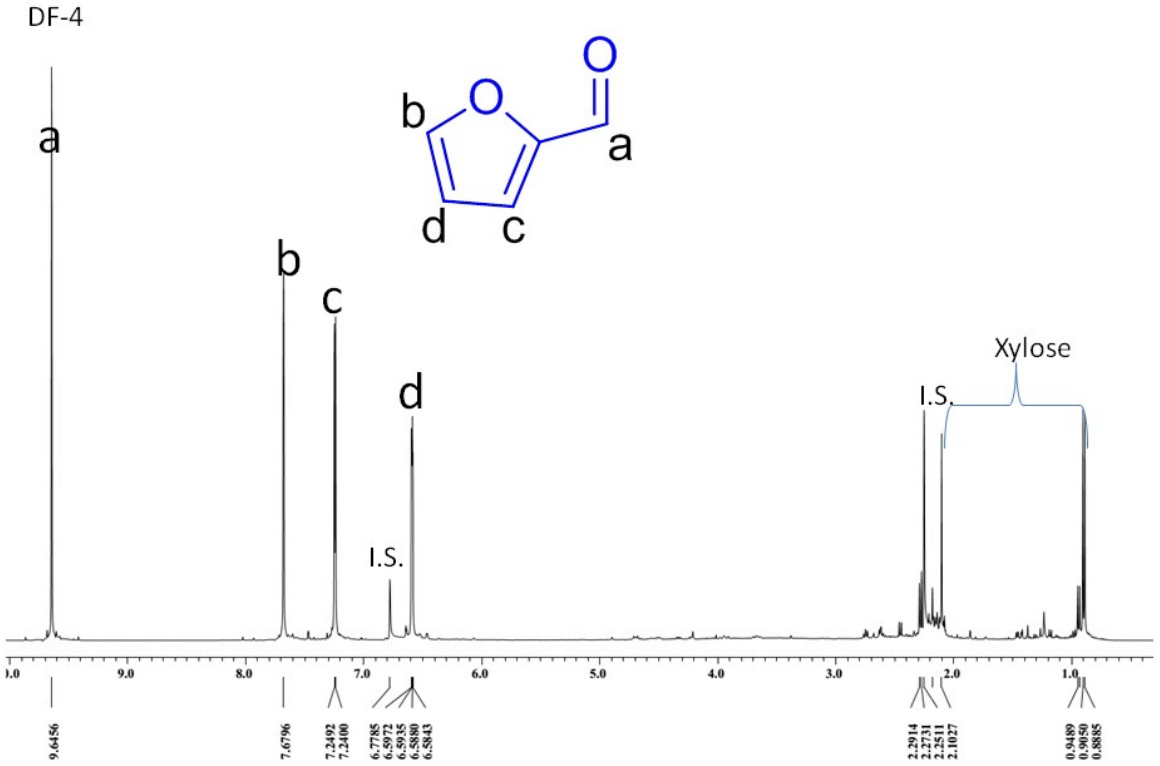

Figure: S4. [1]H-NMR spectra of furfural in CDCl3, synthesis from furfural. Reaction condition

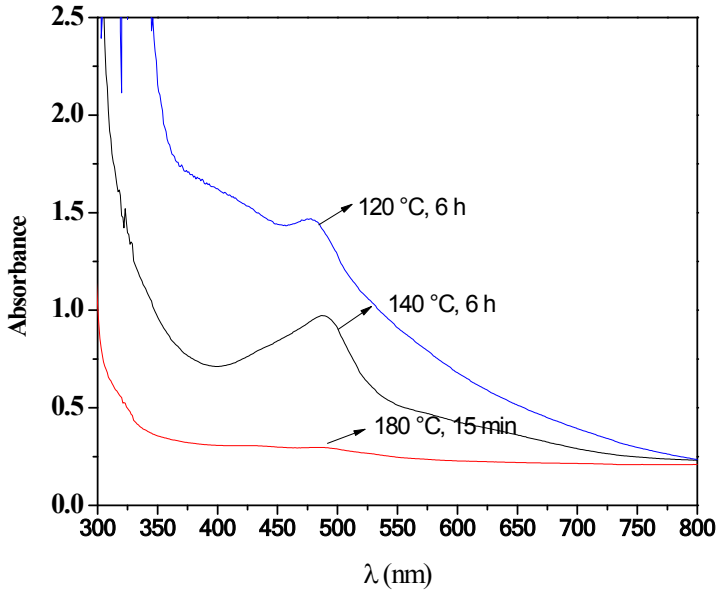

Figure: S5 UV-visible spectrum of phenol-sulphonic acid experiment, calculating total reducing sugar.

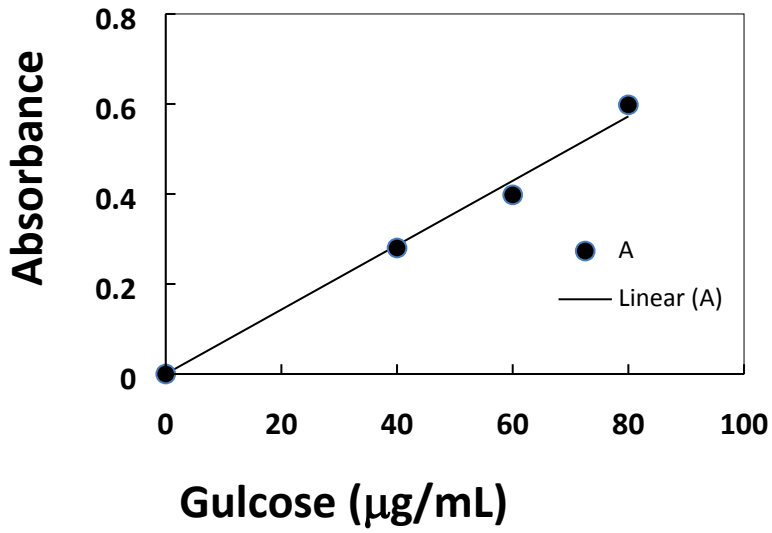

Figure S6: Four point calibration plot of standard Glucose

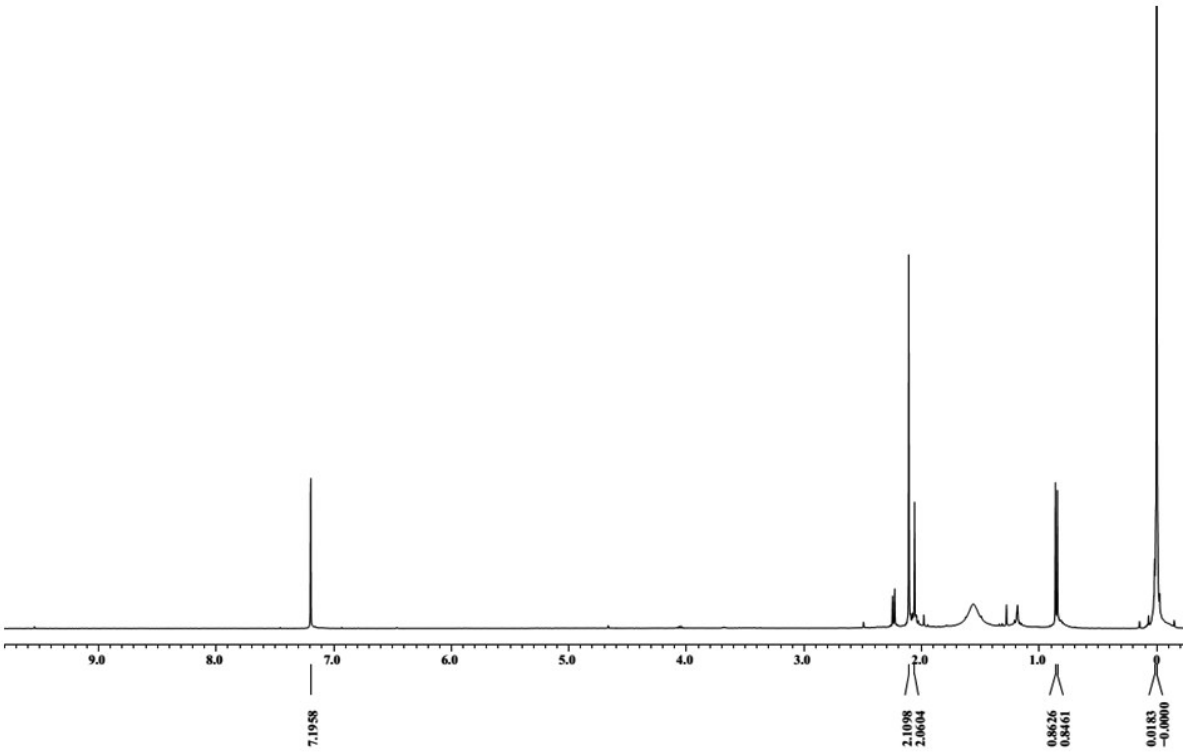

Figure S7; Blank experiment, ^{1} H NMR ($CDCl_3$), Glucose = 10 mmol, T = 140 °C, t= 6 h.

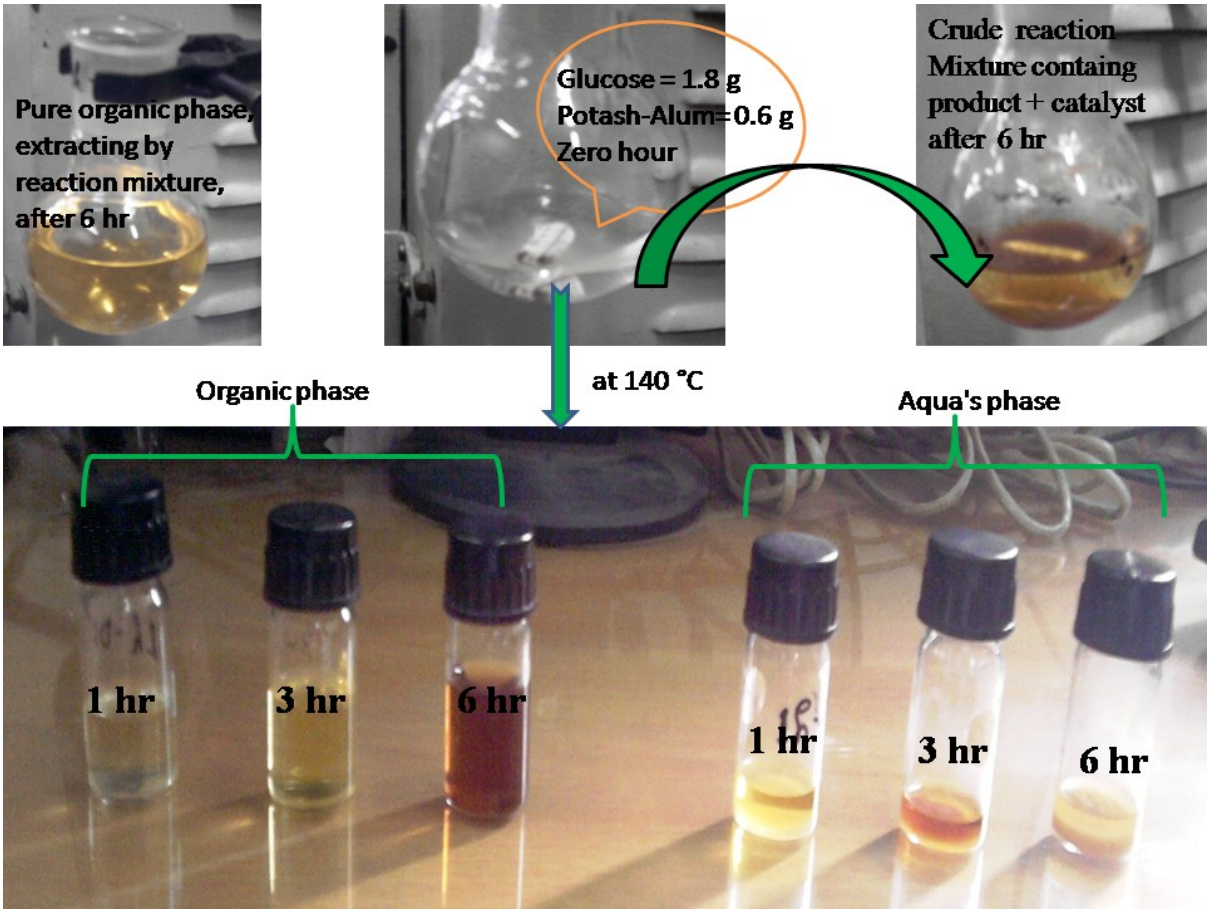

Figure S8: Time dependent dehydration of Glucose to HMF, change of product color show as time of reaction increase, other reaction condition Glucose = 10 mmol, PA = 1.2 mmol, solvent =10 mL (water +MIBK,1:4), Temperature = 140 °C.