

Electronic Supplementary Material

Symmetrical and Unsymmetrical Bronsted acidic ionic liquids for the effective conversion of Fructose to 5-Hydroxymethyl furfural

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1. Characterization of Ionic liquids

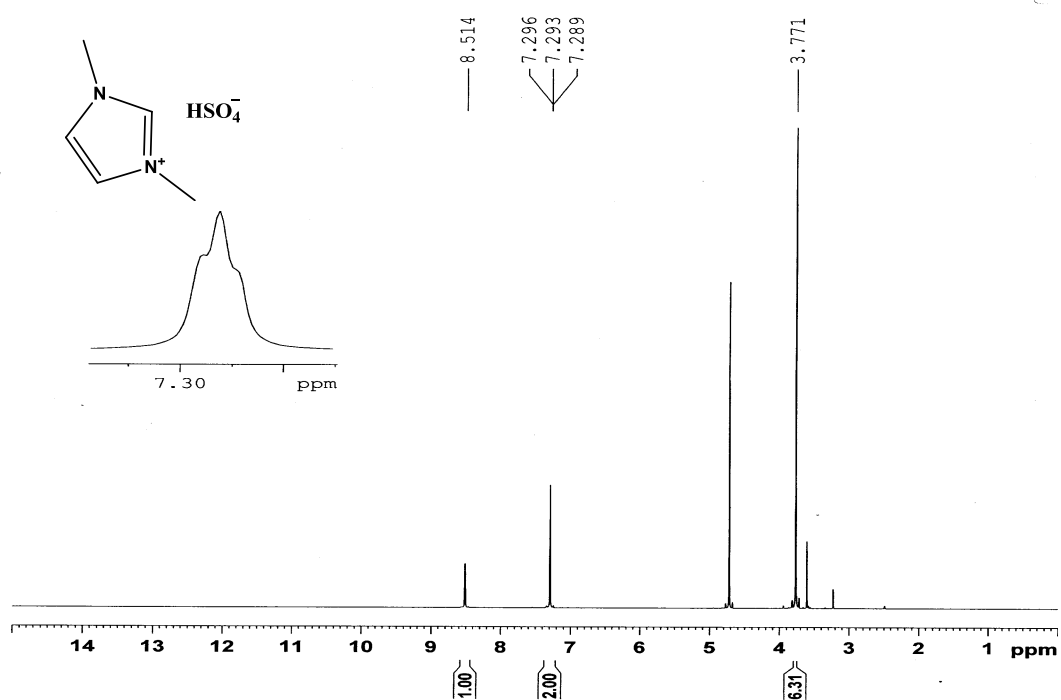
- ^1H and ^{13}C NMR of [MMIM] HSO_4 (Figure S1)
- ^1H and ^{13}C NMR of [MMBIM] HSO_4 (Figure S2)
- ^1H and ^{13}C NMR of [HMBIM] HSO_4 (Figure S3)
- ^1H and ^{13}C NMR of [PSMBIM] HSO_4 (Figure S4)
- TGA of [MMIM] HSO_4 (Figure S5)
- TGA of [MMBIM] HSO_4 (Figure S6)
- TGA of [PSMBIM] HSO_4 (Figure S7)
- TGA of [HMBIM] HSO_4 (Figure S8)

2. Identification and Characterization of 5-Hydroxymethylfurfural

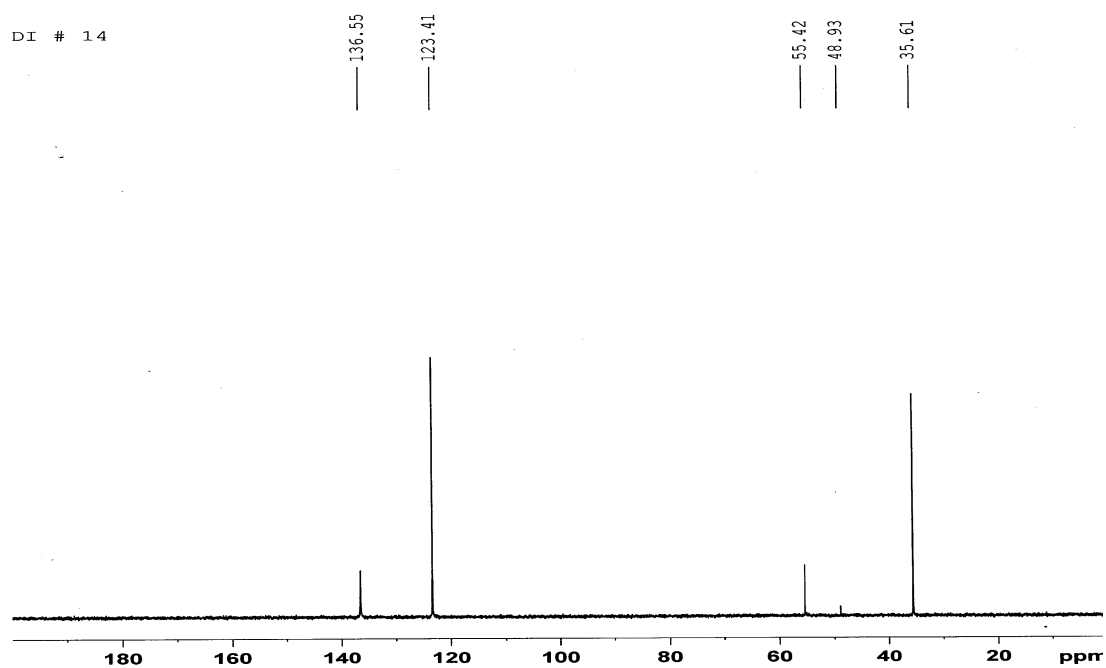
- GC-MS of 5-Hydroxymethyl furfural (Figure S9)
- HPLC measurement using UV and RI detector (Figure S10)
- ^1H and ^{13}C NMR of HMF (Figure S11)

The ^1H and ^{13}C NMR of synthesized Ionic liquids

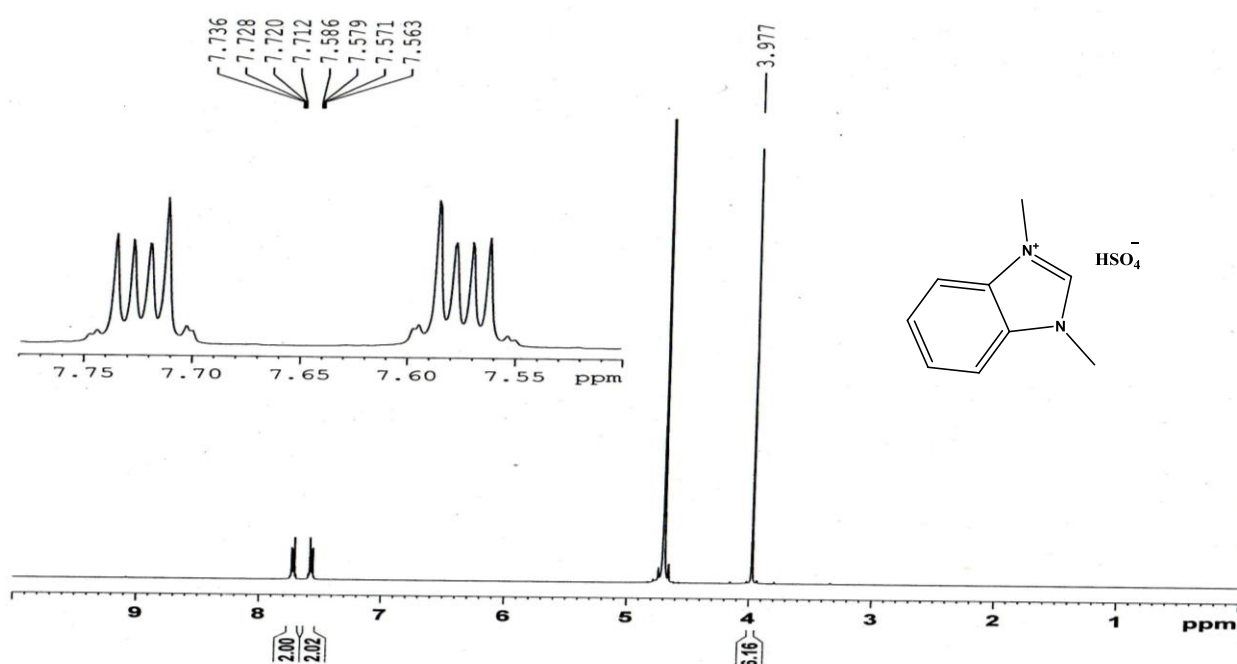
^1H NMR of [MMIM] HSO_4^- (Figure S1)



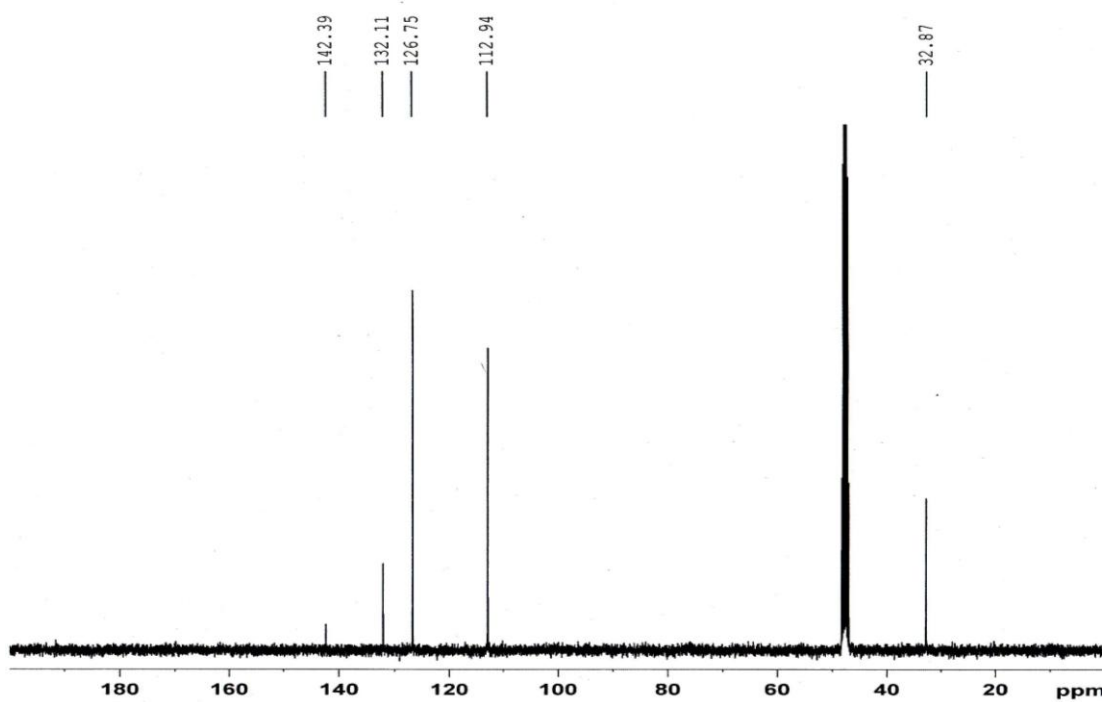
^{13}C NMR of [MMIM] HSO_4^-



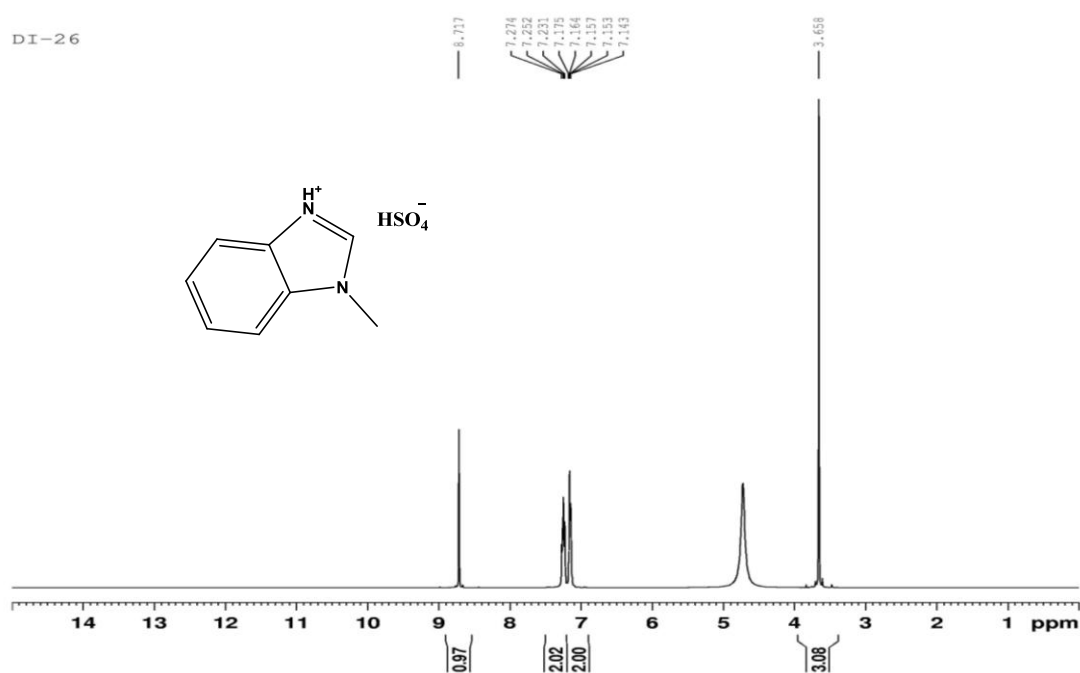
^1H NMR of [MMBIM] HSO_4 (Figure S2)



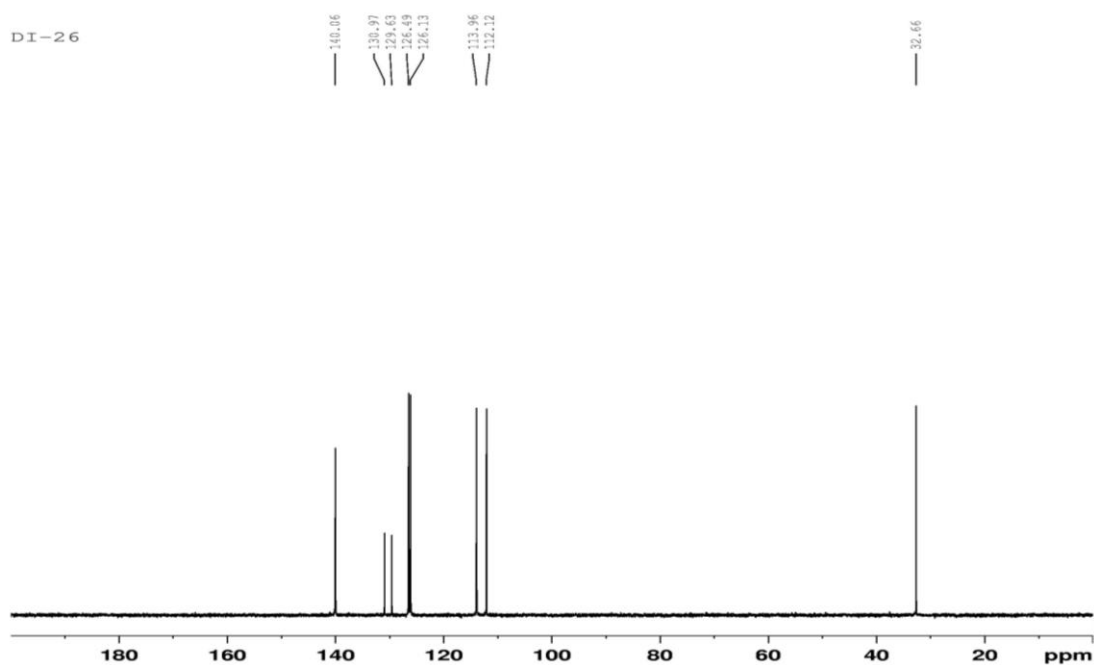
^{13}C NMR of [MMBIM] HSO_4



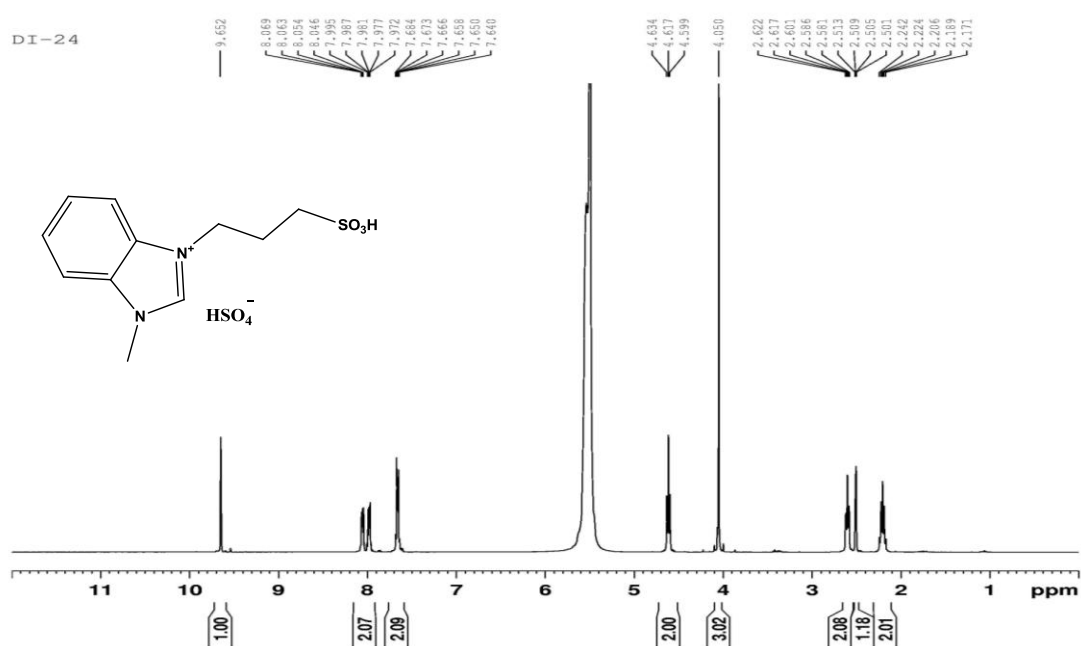
¹H NMR of [HMBIM] HSO₄ (Figure S3)



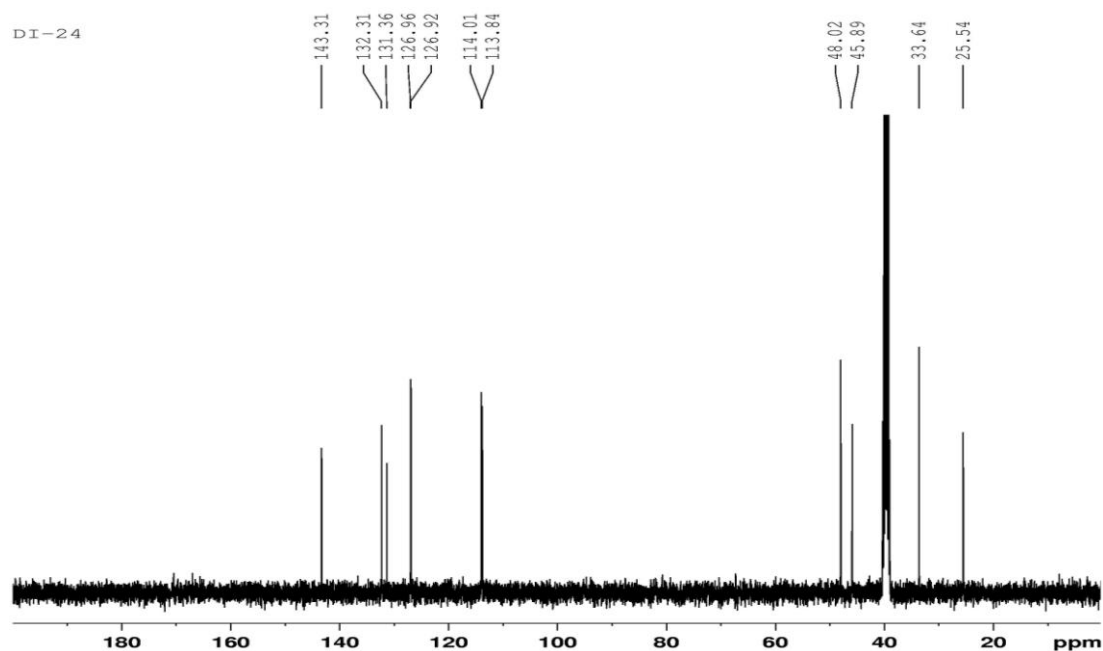
¹³C NMR of [HMBIM] HSO₄



^1H NMR of [PSMBIM] HSO_4 (Figure S4)

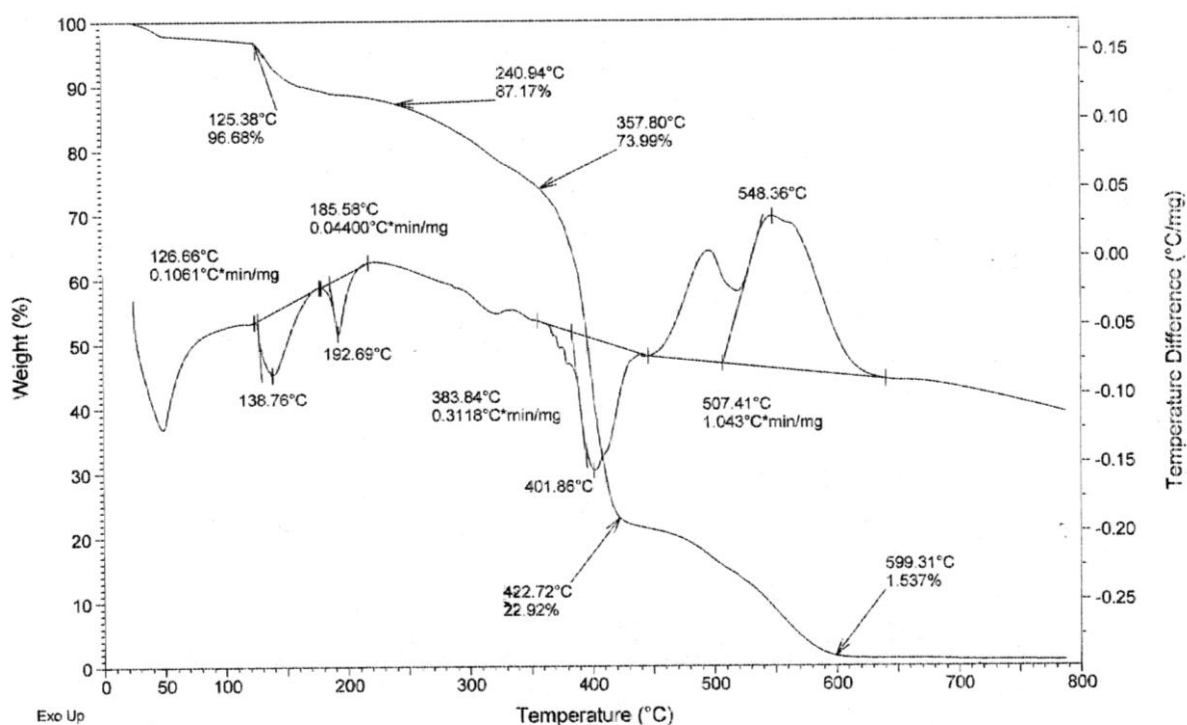


^{13}C NMR of [PSMBIM] HSO_4

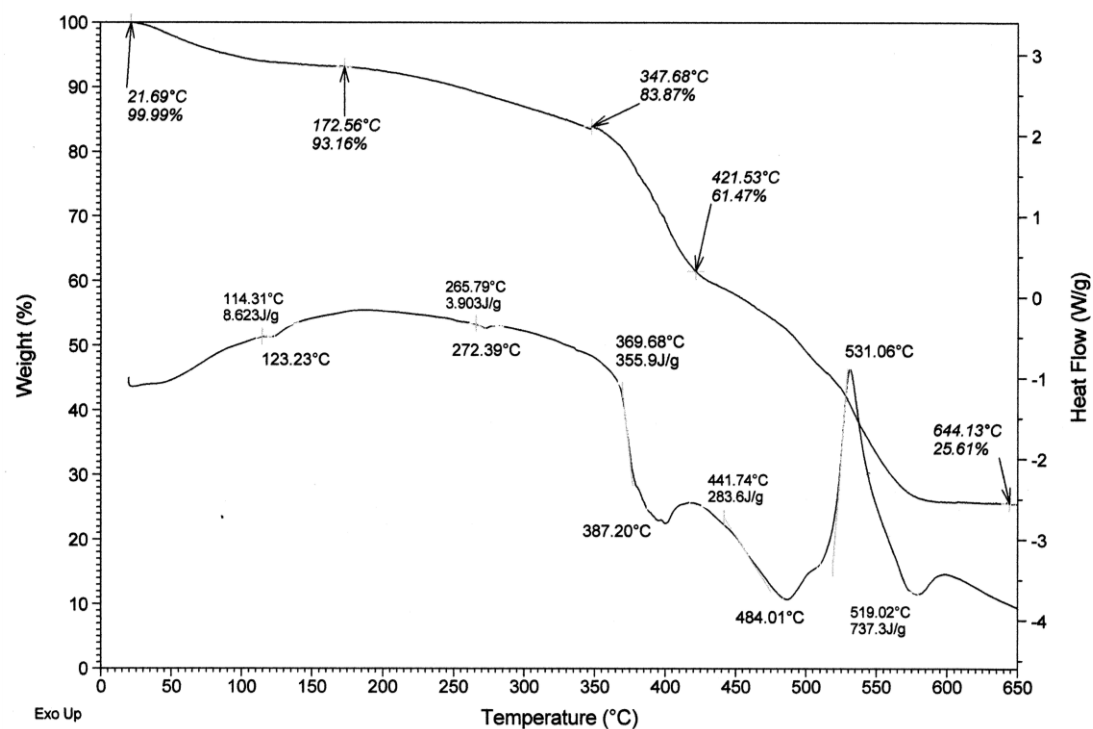


Thermogravimetric analysis graph

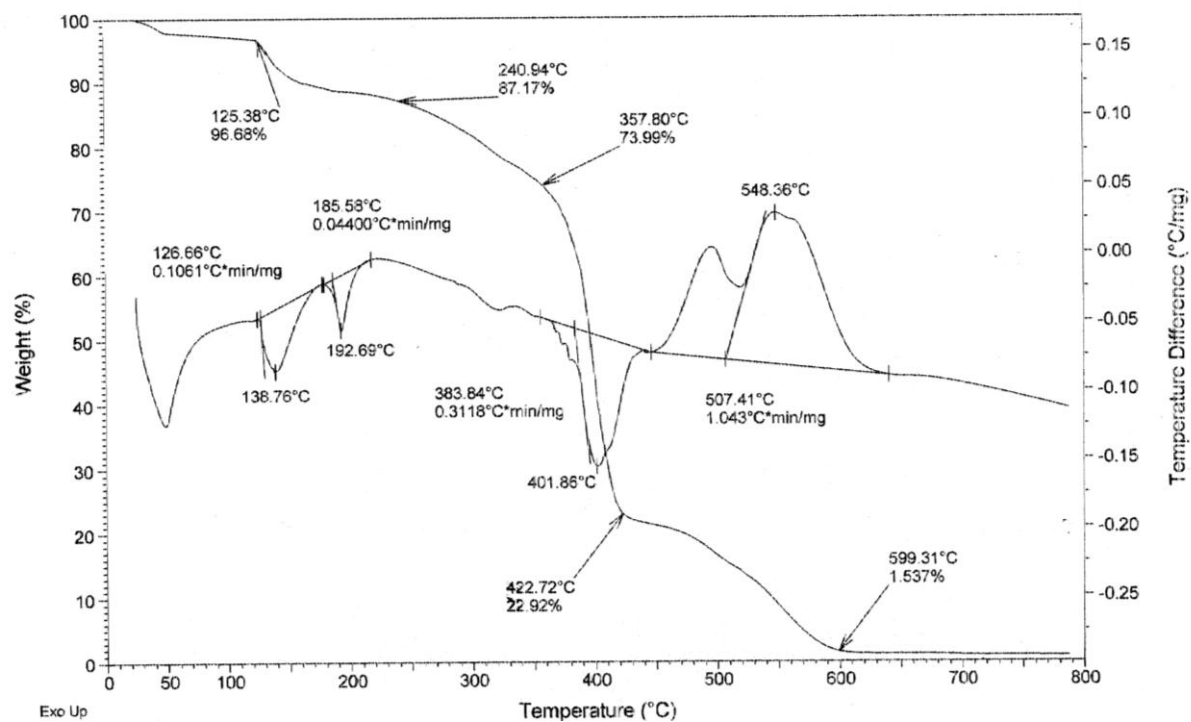
[MMIM] HSO₄ (Figure S5)



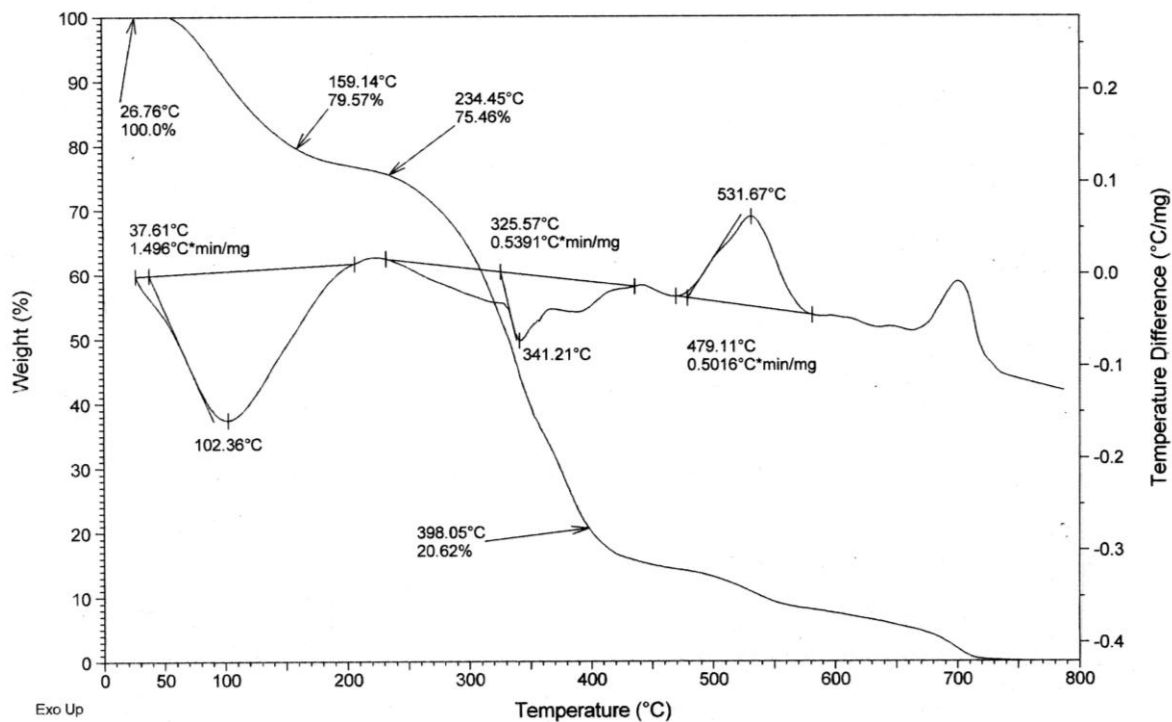
[MMBIM] HSO₄ (Figure S6)



[HMBIM] HSO₄ (Figure S7)

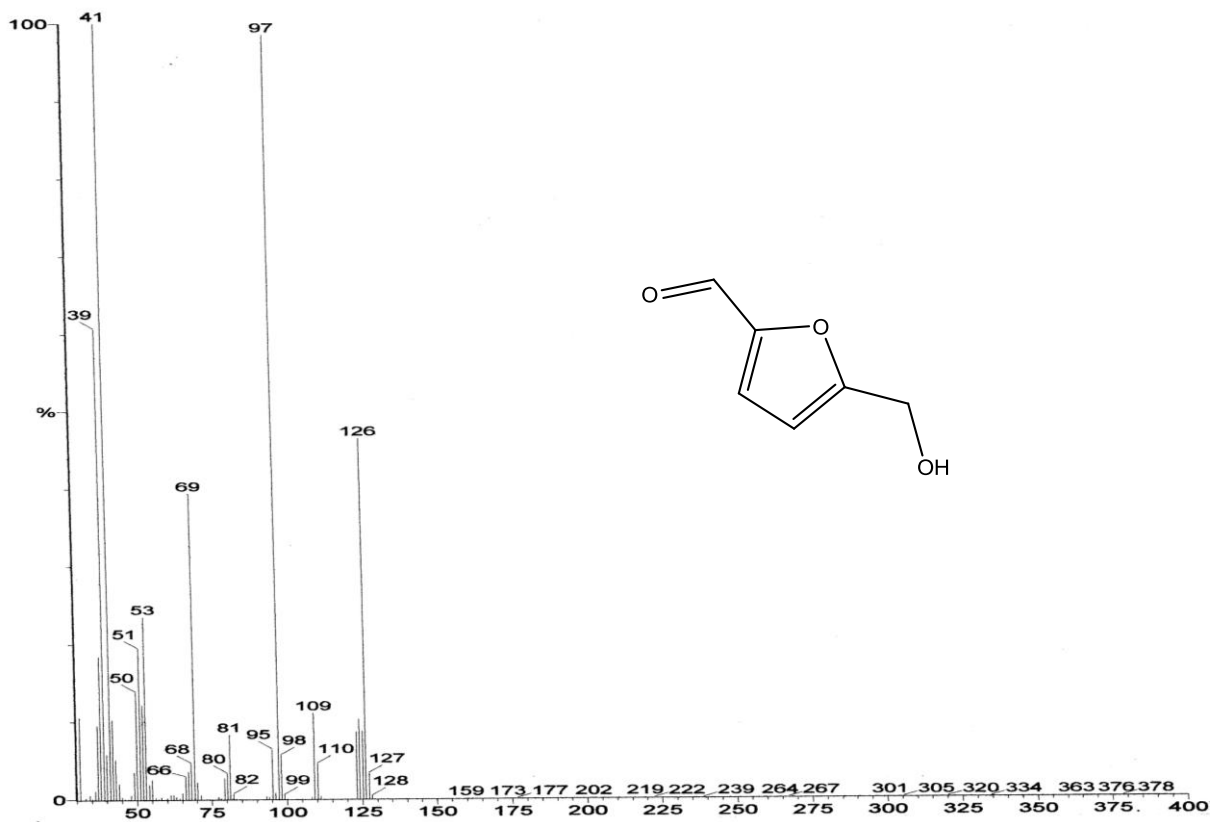
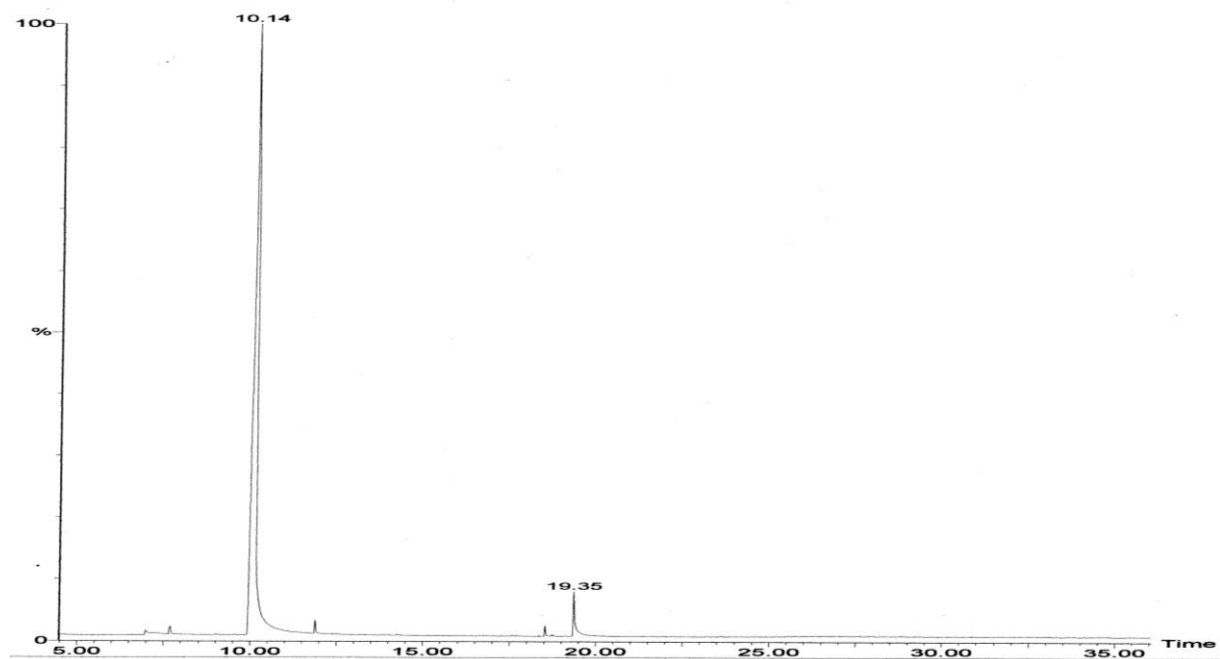


[PSMBIM] HSO₄ (Figure S8)

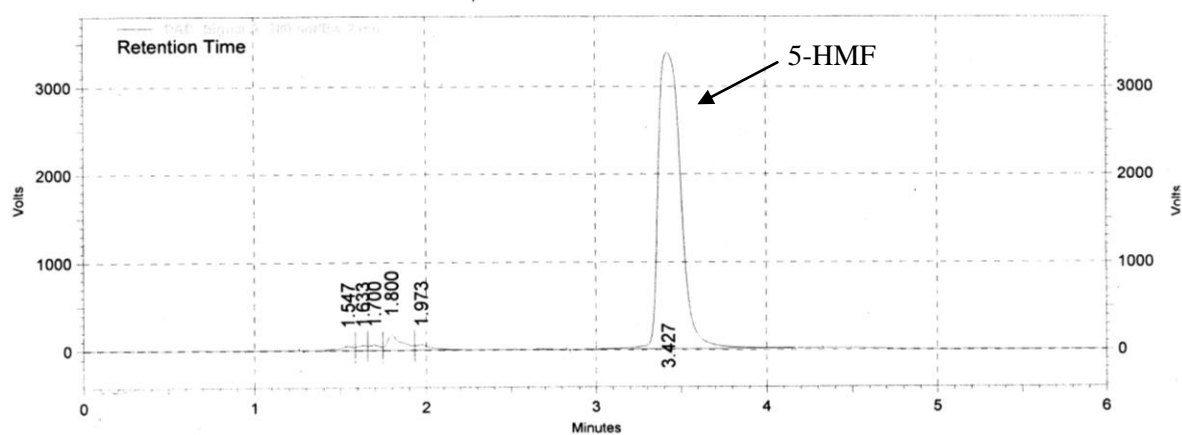


Identification and Characterization of 5-Hydroxymethylfurfural

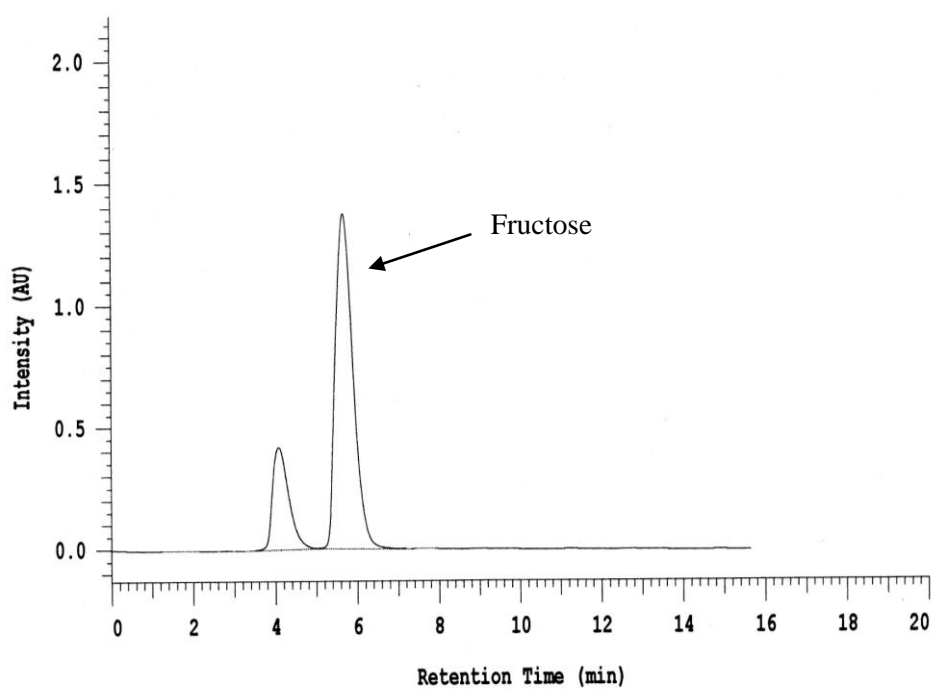
GC-MS of 5-Hydroxymethyl furfural (**Figure S9**)



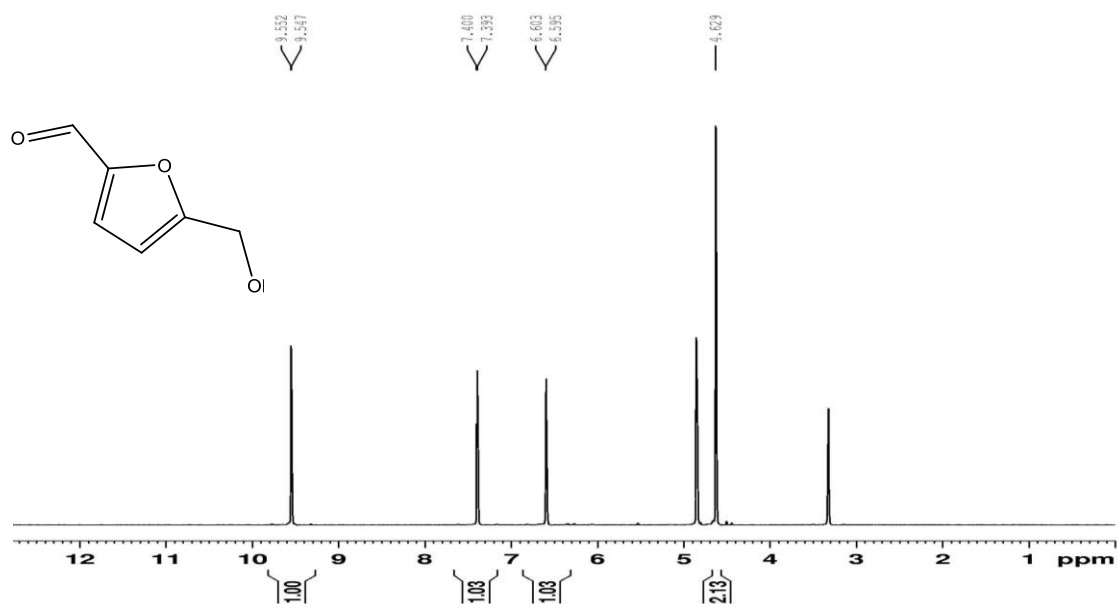
HPLC-UV of 5-Hydroxymethyl furfural (**Figure S10**)



HPLC-RI of 5-Hydroxymethyl furfural



¹H NMR of 5-HMF (**Figure S11**)



¹³C NMR of 5-HMF

