**Abstract**

An attempt to the global clarion call to explore for an alternative source of environmentally friendly, renewable and cheaper energy (fuel) source than the conventional fossil fuel, was made in this study. This involved testing the effects of three catalysts (potassium carbonate K2CO3, calcium hydroxide Ca(OH)2 and magnesium oxide MgO) in the empty fruit bunch (EFB) pyrolysis on the product yields. The Ca(OH)2 catalyzed EFB pyrolysis gave the maximum percentage yield (42.64%) of bio-oil. The maximum bio-oil percentage yield from the Ca(OH)2 catalyzed EFB pyrolysis was obtained at pyrolysis temperature of 600 °C, sweeping gas flow rate of 200 mL/min and using 10 wt.% of the catalyst. The GC–MS analysis of the Ca(OH)2 catalyzed EFB pyrolysis showed an increase (10.68%) in the desirable phenolic content and a reduction (35.21%) in the undesirable acidic components of the bio-oils when compared with the phenolic (16.74%) and acidic (42.88%) components of non catalyzed EFB pyrolysis bio-oil. This study has revealed that the quantity and quality of bio-oils can be improved using Ca(OH)2 catalyzed biomass pyrolysis.