

## **Thermal analysis of kenaf fiber reinforced floreon biocomposites with magnesium hydroxide flame retardant filler**

### **ABSTRACT**

The Floreon (FLO) biopolymer is an advanced bioplastic materials, invented by The University of Sheffield and CPD Plc, in November 2013. Nine combinations of the kenaf fiber (KF) reinforced FLO with magnesium hydroxide (MH) flame retardant filler were fabricated and tested on Thermogravimetry Analysis, Differential Scanning Calorimetry, and Dynamic Mechanical Analysis (DMA). Scanning electron microscopy has been used to study the cross-section of interface. The low thermal stability of natural fiber composite has found lower decomposition temperature but a higher residual mass. MH filler containing composite has higher residual mass at 600°C but it is not the best flame retardant for the FLO biopolymer composites as the pure FLO biopolymer has higher decomposition temperature than MH reaction temperature. Some synergistic effect located in char formation, T<sub>g</sub> reduction and a lower tan δ peak shown in the three phase system (KF/FLO/MH). The MH filler has found more significant in enhancing mass residual. The T<sub>g</sub> were show deterioration for all samples compared with the pure FLO biopolymer. The melting temperature has found no significant change either KF or MH or both of these were inserted. The values of coefficient, C recorded decreasing as increasing the fiber loading. This showing the fibers transfer the loading effectively. Close value of storage moduli found in DMA for all samples except sample 4.