

## **Durability Studies of Solid Pellets from Torrefied *Leucaena Leucocephala***

### **Abstract**

Torrefaction of *Leucaena Leucocephala* was performed in a fixed bed reactor at temperature of 300 C and 20 minutes holding time under inert environment. The torrefied *Leucaena Leucocephala* was pelletized with starch as the binder. Two parameters were investigated such as different ratio of starch addition to torrefied *Leucaena Leucocephala* pellets and the thickness of torrefied *Leucaena Leucocephala* pellets towards its durability. The ratios of starch addition to torrefied *Leucaena Leucocephala* pellets studied were 0, 5, 10, 15, 20 and 25 wt%. Meanwhile, the studied thickness of torrefied *Leucaena Leucocephala* pellets were 0.3, 0.4, 0.5, 0.6 and 0.7 cm. It was observed that when the ratio of starch addition to torrefied *Leucaena Leucocephala* pellets was varied from 0-25 wt%, the durability increased steadily and the highest durability of 56.06% was achieved at 20 wt%. When the thickness of torrefied *Leucaena Leucocephala* pellets was increased from 0.3-0.7 cm, the highest durability of 93.18 % was achieved at 0.5 cm thickness. Scanning Electron Microscope (SEM) analysis was performed on the torrefied *Leucaena Leucocephala* pellets of 0 and 20 wt% ratio of starch addition. SEM images show the existence of some minor pores on the surface of torrefied *Leucaena Leucocephala* pellet at 250X and 1000X magnifications.