

The chemical and strength properties of 15-year-old cultivated Acacia hybrid treated through the hot oil treatment process

Abstract

Chemical and strength properties of thermally modified cultivated 15-year-old Acacia hybrid were investigated. Logs of A. hybrid were harvested and cut at the bottom, middle and top portions. The wood later underwent hot oil thermal modification using palm oil at temperatures 180, 200 and 220 °C for 30, 60 and 90 min. Untreated wood was used as control. The hot oil thermal modification process caused some features changed in the chemical composition and strength properties of A. hybrid wood. The degradation in holocellulose, cellulose, and hemicellulose contents was recognized when acacia woods were exposed to oil thermally modified process. Holocellulose and cellulose degraded with the increasing of treatment temperature and duration of heating exposure, while lignin showed the increment in content through this treatment. The strength properties of the oil heat treated A. hybrid wood decreases in values of both MOR and MOE throughout the treatment process. The decreases in values were influenced by temperature and duration of the treatment.