Fuel pellet made from para-rubber sawdust blend with Cajuput (Melaleuca cajuputi Powell) and She Oak (Casuarina equisetifalia) leaves
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Abstract: The aim of this study is to evaluate the fuel pellet potential made from para-rubber sawdust (PS) blend with Cajuput and She oak leaves (CL and SL). CL and SL which collected from the local area were cleaned and dried in sunlight and ground to size below 2 millimeters. PS was brought from the nearby pellet factory. The fuel pellet was composed of a fixed ratio of PS and blended with other raw biomass (CL and SL) at 70 wt.% of PS and 30 wt.% of the others. The fuel pellets were produced by the single pelletizer unit at compression pressure and temperature of 350 psi and 140°C, respectively. There were 6 conditions of pellet samples; pure raw material (PS, CL, SL), 70:30 (PS:CL, PS:SL) and 70:15:15 (PS:CL:SL). Thereafter, the pellet from each condition were characterized by calorific value, pellet density, pellet strength, proximate analysis, ultimate analysis and thermogravimetry analysis (TGA). The calorific values of PS, CL, SL, PS:CL, PS:SL and PS:CL:SL were 17.78, 20.15, 19.46, 18.36, 18.24 and 18.19, respectively. Whereas, the highest pellet density and strength was 1102.57 kg/m³ and 5.53 MPa, which received from PS+CL. However, it was also provided highest ash content at 4.48%. The study results indicated that blending of CL and SL into PS pellet could change the pellet properties. The better properties were received from the CL blending than SL.

Keywords: Fuel pellet; Para-rubber sawdust; Cajuput; She Oak; TGA