

Study of Separation of Coal Ash Contents on the Mallawa Region Using Method Dense Medium Separation

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Abstract. Coal is one alternative fuel, which has the potential to provide most of the country's energy needs. Steam power plants (PLTU) are the sector that represents the most significant utilization of domestic coal. The coal from Mallawa, Maros Regency, South Sulawesi Province is categorized as type C sub-bituminous coal. This type of coal when sold has a relatively low cost due to low calorific value, sulfur content above 1%, and high ash content, so if burned it will harm the environment. From these problems, Mallawa coal can be improved by separating coal ash using the Dense Medium Separation (DMS) method. The purpose of this research is to determine the yield value and percent of ash elimination after separation using different fractions. The ash separation process was carried out on four size fractions, namely -60+80, -80+100, -100+150, and -150+200 mesh with a separating medium, namely perchloroethylene solution which has a density of 1.6 g/ml. Before the coal ash separation process was carried out, initial characterization was carried out. XRD analysis was conducted to determine the minerals contained in coal. Proximate analysis, calorific value, and total sulfur analysis were conducted referring to ASTM (American Society for Testing and Material) standards. The results of XRD analysis showed that the coal sample contained quartz minerals at 41.4%, pyrite at 9.9%, chlorite at 14%, and calcite at 34.6%. The coal ash content in the initial sample was found to be sufficient at 9.07%. From the coal ash separation, the highest ash elimination percent was obtained in the -150+200 mesh fraction at 50.39%, while the highest yield value was found in -60+80 at 33%. This research concludes that the finer the size fraction, the higher the percent of ash elimination obtained, this is inversely proportional to the yield value where the coarser the size fraction, the yield value will increase.

Keywords: Ash, Coal, Dense medium separation, Fraction, Yield