

SARI

Indonesia menjadi salah satu negara yang memiliki cadangan batubara yang besar. Cekungan Sumatera Selatan pada Formasi Muara Enim menjadi salah satu penghasil batubara. Studi tentang karakteristik dan pencairan batubara bertujuan untuk mengetahui karakteristik, persentase konversi, serta pengaruh karakteristik akibat proses pencairan batubara dengan menggunakan metode *solvent extraction*.

Penelitian ini dilakukan pada batubara *seam* B Formasi Muara Enim yang berada di Kecamatan Tanjung Agung, Provinsi Sumatera Selatan. Analisis batubara dilakukan pada 10 sampel berdasarkan jenis litotipe setiap *seam*. Metode analisis yang digunakan yaitu analisis *proximate*, analisis *ultimate*, analisis *vitritine reflectance* (VR), analisis *X-Ray Diffraction* (XRD), analisis petrografi organik pada sayatan poles batubara, serta analisis pencairan batubara dengan menggunakan metode *solvent extraction*.

Berdasarkan analisis *proximate*, *ultimate*, *vitritine reflectance* (VR), dan petrologi organik, batubara daerah penelitian merupakan batubara peringkat rendah jenis *lignite* hingga *sub-bituminous*. Karakteristik petrologi organik didominasi oleh kelompok maseral *huminite* dan *liptinite* serta sedikit kandungan *inertinite*. Mineral yang dijumpai dalam sampel penelitian yaitu pirit, karbonat, kuarsa, mineral lempung, *illite*, *chamosite*, *paragonite*, biotit, K-feldspar, *dolomite*, *montmorillonite*, anatase, dan grafit yang dijumpai dalam jumlah sedikit. Pencairan batubara dengan menggunakan metode *solvent extraction* pada kondisi tekanan dan temperatur yang rendah (55°C) menghasilkan nilai konversi pencairan berkisar antara 29,76%-31,66% dengan rata-rata 30,55%. Karakteristik batubara berdasarkan kandungan *ash*, kandungan mineral, *moisture*, hidrogen, karbon serta rasio H/C secara umum tidak memiliki pengaruh yang signifikan terhadap nilai konversi pencairan batubara yang disebabkan oleh kondisi tekanan dan temperatur yang rendah yang menyebabkan reaksi secara kimiawi berjalan lambat sehingga proses konversi pencairan batubara menjadi tidak maksimal, serta didominasi oleh pelarutan secara fisik. Berdasarkan kelimpahan kandungan maseral reaktif dari kelompok maseral *huminite* dan *liptinite* secara umum memiliki pengaruh terhadap hasil konversi pencairan batubara, sedangkan grup maseral *inertinite* menunjukkan tidak adanya pengaruh terhadap konversi pencairan batubara.

Kata kunci: batubara, maseral, petrografi organik, pencairan batubara, *solvent extraction*

ABSTRACT

Indonesia is one of the countries that have large coal reserves. The South Sumatra Basin in the Muara Enim Formation is one of the coal producers. The study of the characteristics and liquefaction of coal aims to determine the characteristics, conversions, and the effect of the characteristics due to the coal liquefaction process using the solvent extraction method.

This research was conducted on B seam coal of the Muara Enim Formation in Tanjung Agung District, South Sumatra Province. Coal analysis was carried out on 10 samples based on the type of lithotype for each seam. The analytical methods used are proximate analysis, ultimate analysis, vitrinite reflectance (VR) analysis, X-Ray Diffraction (XRD) analysis, organic petrographic analysis of coal cutting poles, and analysis of coal liquefaction using the solvent extraction method.

Based on the analysis of proximate, ultimate, vitrinite reflectance (VR), and organic petrology, the coal in the study area is low-rank lignite to sub-bituminous coal. The organic petrological characteristics are dominated by huminite and liptinite maceral groups and a small amount of inertinite. The minerals found in the study samples were pyrite, carbonate, quartz, clay minerals, illite, chamosite, paragonite, biotite, K-feldspar, dolomite, montmorillonite, anatase, and graphite which were found in small quantities. Coal liquefaction using the solvent extraction method at low pressure and temperature conditions (55°C) produces liquefaction conversion values ranging from 29.76% -31.66% with an average of 30.55%. The characteristics of coal based on ash content, mineral content, moisture, hydrogen, carbon, and H/C ratio, in general, do not have a significant effect on the coal liquefaction conversion value due to low pressure and temperature conditions which cause the chemical reaction to run slowly so that the liquefaction conversion process coal is not optimal, and is dominated by physical dissolution. Based on the contents of the reactive maceral content of the huminite and liptinite maceral groups, in general, it affects the coal liquefaction conversion results, while the inertinite maceral group shows no effect on the coal liquefaction conversion.

Keywords: coal, maceral, organic petrography, coal liquefaction, *solvent extraction*