

INTISARI

Indonesia adalah negara yang kaya akan batubara, dengan total sumberdaya mencapai 97.297,12 juta ton. Batubara di Indonesia didominasi dengan batubara kalori rendah, batubara kalori rendah memiliki nilai keekonomisan yang lebih rendah jika dibandingkan dengan batubara kalori tinggi. Sehingga pemerintah melakukan inisiatif pengembangan batubara untuk meningkatkan nilai tambah pada batubara salah satunya sebagai penghasil *Rare Earth Element and Yttrium* (REY). Penelitian terkait REY pada batubara telah dilakukan di berbagai cekungan batubara di Indonesia di antaranya Cekungan Sumatera Selatan dan Cekungan Ombilin. Kedua cekungan tersebut mengalami pengayaan REY pada batubaranya sehingga dirumuskan penelitian terkait REY pada batubara Formasi Korinci, Cekungan Sumatera Tengah, cekungan penghasil batubara di Pulau Sumatera yang memiliki fitur geologi yang memungkinkan adanya pengayaan REY pada batubaranya. Penelitian ini bertujuan untuk mengetahui konsentrasi dan proses pengayaan REY pada batubara daerah penelitian. Batubara diambil menggunakan metode sampling *ply by ply* kemudian dilanjutkan dengan preparasi sampel untuk analisis petrologi organik serta serangkaian analisis geokimia berupa analisis ultimat, proksimat, *Inductively Coupled Plasma – Mass Spectrometry – Atomic Emission Spectrometry* (ICP – MS/AES).

Batubara daerah penelitian termasuk batubara kalori rendah yang disusun dari litotipe *dull banded coal* dan *dull non-banded coal*. Berdasarkan kelimpahan maseralnya, batubara daerah penelitian dibagi menjadi empat kelompok kelimpahan maseral yaitu *humotellinite-rich group*, *detrohuminite-rich group*, *humotellinite-liptinite-rich group*, dan *humotellinite-inertinite-rich group*. Batubara daerah penelitian memiliki kadar abu bernilai 1,33 – 19,38 (wt% adb) dan kandungan sulfur bernilai 0,22 – 0,76 (% daf). Batubara daerah penelitian terbentuk dari siklus *ombrogenous mire* dan *topogenous mire* dengan dominasi *topogenous mire* yang menghasilkan kadar abu tinggi. Analisis ICP – MS dan ICP – AES menunjukkan hasil berupa batubara daerah penelitian memiliki kandungan total REY yang tinggi dengan rentang nilai 13,92 – 322,86 ppm dan rata – rata 139,16 ppm. Sepuluh dari enam belas sampel batubara daerah penelitian memiliki nilai total REY lebih tinggi dibandingkan dengan *world low-rank coal*. Proses pengayaan REY pada batubara daerah penelitian terjadi secara poligenetis melalui *tuffaceous type* dan *infiltrational type*. Kandungan REY berasal dari hasil lapukan batuan vulkaniklastik Formasi Telisa yang berada di Tinggian Bukit Barisan yang tertransportasi kemudian masuk kedalam gambut. Proses pengayaan REY terjadi ketika fase *topogenous mire* yang menghasilkan kadar abu tinggi.

Kata kunci : *Rare Earth Element and Yttrium* (REY), proses pengayaan REY pada batubara, batubara Formasi Korinci

ABSTRACT

Indonesian is a country with a huge amount of coal, with a total resource of 97,297.12 million tons. Indonesia's coal is dominated by low calorific coal, which has a lower economic value when compared to high calorific coal. In response, the government has initiated coal development to increase the additional value of coal, one of them is as a producer of Rare Earth Element and Yttrium (REY). Research on REY in coal has been conducted in various coal basins in Indonesia including the South Sumatra Basin and the Ombilin Basin. Both basins contain REY enrichment in their coal so that research related to REY in Korinci Formation coal, Central Sumatra Basin, another Sumatran coal producing basin that has geological features that support REY enrichment in its coal is formulated. This study is conducted to determine the concentration and process of REY enrichment in coal of the study area. The coal was taken using the ply by ply sampling method then followed by sampel preparation for organic petrological analysis and a series of geochemical analyses in such as ultimat analysis, proximat analysis, Inductively Coupled Plasma - Mass Spectrometry - Atomic Emission Spectrometry (ICP - MS/AES) analysis.

Coal in the research area is a low- calorific coal composed by dull banded coal and dull non-banded coal lithotypes. Based on the maceral abundance, it is divided into four groups, which are humotellinite-rich group, detrohuminite-rich group, humotellinite-liptinite-rich group, and humotellinite-inertinite-rich group. Coal in the study area have an ash content of 1.33-19.38 (wt% adb) and sulphur content of 0.22-0.76 (% daf). The coal in the research area formed by ombrogenous mire and topogenous mire cycles with the dominance of topogenous mire that produces high ash content. ICP-MS and ICP-AES analysis shows that the coal in the study area contains high total REY with a value range of 13.92 - 322.86 ppm and an average of 139.16 ppm. Ten of the sixteen coal sampels in the study area have higher total REY values compared to world low-rank coal. The REY enrichment process in coal in the research area occurs polygenetically through tuffaceous type and infiltrational type. The REY content came from the weathering of volcaniclastic rocks of the Telisa Formation located in the Barisan Mountain that were transported into the peat. The REY enrichment process occurs during the topogenous mire phase which produces high ash content.

Keywords : *Rare Earth Element and Yttrium (REY), REY enrichment process on coal, Korinci Formation coal*