KARAKTERISTIK DAN GENESIS *COAL BALL* DI LAPANGAN TAMBANG AIR LAYA, FORMASI MUARA ENIM, TANJUNG ENIM, SUMATERA SELATAN

ABSTRAK

Coal ball (konkresi batubara) Formasi Muara Enim ditemukan di *seam* Suban Bawah (B2), Lapangan Tambang Air Laya (TAL), Tanjung Enim, Sumatera Selatan. Penelitian ini bertujuan untuk mengetahui kondisi geologi lapangan, karakteristik, dan genesis *coal ball* di lokasi penelitian. Metode yang digunakan dalam penelitian ini adalah pengolahan data struktur geologi (meliputi: penentuan arah gaya utama, analisis *fault displacement*, dan analisis *fracture intensity*), analisis sayatan petrografi, analisis XRD (*X-Ray Diffraction*), analisis geokimia anorganik dengan ICP-AES/MS (*Inductively Coupled Plasma – Atomic Emission Spectrometry / Mass Spectrometry*), analisis *vitrinite reflectance* (VR), dan analisis data sekunder (meliputi: data proksimat dan *heating value seam-seam* batubara di lokasi penelitian serta kolom litologi bawah permukaan). Analisis data lapangan menunjukkan bahwa keberadaan *coal ball* dikontrol oleh struktur geologi berupa kekar gerus. *Coal ball* terbentuk di bagian sudut tumpul dari kekar gerus dengan orientasi sumbu panjang searah dengan sumbu lancip kekar gerus. Pengamatan petrografi pada *coal ball* menunjukkan komposisi maseral dan mineral yang mirip dengan *seam* induk, indikasi bahwa *coal ball* berasal dari massa batubara yang sama dengan *seam* induknya. Mineralogi *coal ball* disusun oleh kuarsa, pirit, mineral karbonat, dan mineral lempung dengan kuarsa sebagai mineral dominan. Tidak ada inti konkresi yang teramati. *Coal ball* memiliki kandungan senyawa oksida dominan berupa SiO_2 dan Al_2O_3 serta nilai Rvmax (VR *maxium*) >1% yang mengindikasikan adanya pengaruh intrusi. Pembentukan *coal ball* sesuai dengan teori *thermal-mechanical* yang disebabkan oleh adanya segmentasi kekar dan pengaruh panas intrusi pada batubara. Studi *coal ball* bermanfaat untuk memahami urutan temporal struktur geologi dan intrusi di lokasi penelitian.

Kata kunci: *Coal ball, seam* Suban Bawah, karakteristik, genesis

CHARACTERISTICS AND GENESIS OF COAL BALL IN AIR LAYA MINE SITE, MUARA ENIM FORMATION, TANJUNG ENIM, SOUTH SUMATERA

ABSTRACT

Coal ball (coal concretion) of Muara Enim Formation is found in Lower Suban seam (B2), Air Laya Mine Site, Tanjung Enim, South Sumatera. This research aims to understand the field geological condition, characteristics, and genesis of coal ball in the study area. Methods used in this research are geological structure analysis (comprising: maximum compressive stress determination, fault displacement analysis, and fracture intensity analysis), petrography analysis, XRD (X-Ray Diffraction) analysis, inorganic geochemistry analysis using ICP-AES/MS (Inductively Coupled Plasma – Atomic Emission Spectrometry / Mass Spectrometry), vitrinite reflectance analysis (VR), and secondary data analysis (comprising: proximate data and heating value of coal seams in study area, and subsurface lithology column). Field data analysis shows that the presence of coal ball is controlled by shear fracture. Coal ball is formed in the obtuse angle of shear fracture with long axis orientation parallel to the direction of shear fracture's acute angle. Petrography analysis shows that coal ball consisted of similar maceral and mineral composition to the parent coal, this indicates that coal ball is formed from the same coal mass with its parent coal. Mineralogy of coal ball consists of quartz, pyrite, carbonate, and clay with quartz as the most abundant one. There is no nuclei observed. Coal ball has high content of SiO_2 and Al_2O_3 along with RVmax (maximum VR) value of >1% which indicates the presence of intrusion heat effect. The formation of coal ball is corresponding to thermal-mechanical origin which cause by segmentation by shear fractures and intrusion heating. The study of coal ball in the research area can be used to learn the temporal order of geological structure and intrusion in the study area.

Keywords: *Coal ball, Lower Suban seam, characteristics, genesis*