

## SARI

Formasi Bobong yang melampar di daerah Pulau Taliabu merupakan formasi pembawa batubara yang berumur Jura. Penelitian tentang karakteristik petrografi organik dan geokimia serta hubungannya dengan maksimum *free swelling index* batubara masih sedikit dilakukan. *Free swelling index* merupakan parameter penting di dalam industri kokas, sehingga dapat dimanfaatkan secara optimal. Penelitian ini bertujuan untuk menganalisis hubungan antara karakteristik petrografi organik dan geokimia dengan maksimum *free swelling index* batubara di daerah penelitian.

Metode yang digunakan meliputi observasi lapangan dan pengambilan sampel batubara dengan metode *channel sampling ply by ply*. Analisis laboratorium yang dilakukan terhadap 10 sampel batubara meliputi analisis petrografi organik, proksimat, ultimat, *gross calorific value* (nilai kalori), *free swelling index* (FSI). Variabel bebas (X) yang digunakan yaitu meliputi kelompok maseral *reactive*, kandungan abu (*ash*), kandungan total sulfur, kandungan zat terbang (*volatile matter*), kandungan unsur hidrogen dan kandungan unsur karbon serta data variabel terikat (Y) yaitu *free swelling index* batubara. Analisis hubungan antara masing-masing variabel bebas (X) terhadap variabel terikat (Y) dilakukan dengan metode regresi linier sederhana.

Batubara Formasi Bobong terdiri dari 2 *seam*, yaitu *seam 1* dengan ketebalan 0,5 m hingga 1 meter dan *seam 2* dengan tebal 0,50 - 1 meter. Kedua *seam* batubara tersebut secara dominan termasuk dalam *litotipe bright coals* dan *banded bright coals*. Batubara tersebut memiliki *gross calorific* 13.896,26-15.362,54 (Btu/lb) dan nilai proksimat berupa karbon tertambat 36,10 - 43,86 (% , adb), kandungan zat terbang 38,25 - 47,91 (% , adb), kandungan air 6,54 - 12,23 (% , adb) dan kandungan abu 64,46 - 21,31 (% , adb). Batubara *seam 1* dan *seam 2* di daerah penelitian merupakan *high volatile A bituminous coals*. Ultimat pada batubara Formasi Bobong adalah karbon 64,46 - 74,75 (% , daf), hidrogen 6,27 - 6,92 (% , daf), nitrogen 0,76 - 0,87 (% , daf), sulfur 4,41 - 7,93 (% , adb) dan oksigen 9,45 - 18,07 (% , daf). Sedangkan untuk nilai maseral berupa vitrinit adalah 69,75 - 77,52 (% , vol), liptinit 17,56 - 22,50 (% , vol) dan inertinit 3,60 - 7,75 (% , vol).

Hasil penelitian pada batubara Formasi Bobong, tidak ditemukan hubungan antara nilai maseral, proksimat dan ultimat dengan *free swelling index* batubara. Hal ini dipengaruhi oleh nilai *free swelling index* yang konstan yaitu 1.

Kata kunci : *Formasi Bobong, petrografi organik, geokimia, free swelling index, Taliabu*

## ABSTRACT

*The Bobong Formation which extends over the Taliabu Island area is a coal carrier formation that is jura in age. Little research on organic and geochemical petrographic characteristics and their relationship with the maximum free swelling index of coking coal is still being done. The free swelling index is an important parameter in the coke industry so that it can be used optimally. This study aims to analyze the relationship between organic petrographic and geochemical characteristics with the maximum free swelling index of coking coal in the study area.*

*The method used includes field observations and coal sampling with the ply by ply channel sampling method. Laboratory analysis conducted on 10 coal samples included organic, proximate, ultimate, gross calorific value (calorific value), free swelling index (FSI) analysis. The independent variable (X) used includes the reactive maceral group, ash content, total sulfur content, volatile matter, hydrogen, and carbon element content, and data on the dependent variable (Y), namely the free swelling index of coal. The analysis of the relationship between each independent variable (X) and the dependent variable (Y) was carried out using a simple linear regression method.*

*The Bobong Formation coal consists of 2 seams, including seam 1 with a thickness of 0.5 m to 1 meter, seam 2 with a thickness of 0,5 meter to 1 meters. The three coal seams are predominantly included in the lithotype of bright coals and banded bright coals. The coal has a gross calorific value of 13,896.26-15,362.54 (Btu / lb) and a proximate value in the form of tethered carbon 36.10 - 43.86 (% , adb), volatile matter 38.25 - 47.91 (% , adb ), moisture content from 6.54 - 12.23 (% , adb) and ash content from 64.46 - 21.31 (% , adb). Seam 1 and seam 2 in the study area are high volatile A bituminous coals. Ultimat in the Bobong Formation coal is carbon 64.46 - 74.75 (% , daf), hydrogen 6.27 - 6.92 (% , daf), nitrogen 0.76 - 0.87 (% , daf), sulfur 4 , 41 - 7.93 (% , adb) and oxygen 9.45 - 18.07 (% , daf). Meanwhile, the maceral values in the form of vitrinite are 69.75 - 77.52 (% , vol), liptinite 17.56 - 22.50 (% , vol) and inertinite 3.60 - 7.75 (% , vol).*

*The results of research on the coal of the Bobong Formation found no relationship between the maceral, proximate and ultimate values with the free swelling index of coal. This is influenced by the value of the free swelling index which is constant, namely 1.*

**Keyword :** Taliabu, bobong formation, petrografi organik, geochemistry, free swelling index