

SARI

Bauksit merupakan endapan utama penghasil bijih aluminium. Selama kegiatan penambangan bauksit, diperlukan adanya upaya optimasi untuk meningkatkan kualitas produksi hasil tambang. Salah satu upaya optimasi kualitas bauksit sebelum diekstraksi menjadi logam aluminium adalah melakukan pencucian bauksit. Penelitian ini bertujuan untuk mengetahui karakteristik bauksit dan pengaruh persebaran ukuran butir konkresi bauksit hasil pencucian bauksit terhadap kadar Al_2O_3 pada profil vertikal bauksit di daerah Natai, Kecamatan Tayan, Kabupaten Sanggau, Provinsi Kalimantan Barat. Metode analisis yang dilakukan adalah petrografi, XRD (*X-ray Diffraction*), XRF (*X-ray Fluorescence*), dan *particle size distribution* pada sampel batuan dasar dan konkresi bauksit. Berdasarkan hasil penelitian, pembentukan bauksit pada daerah Natai terbagi menjadi tiga zona horizon yang terbentuk, yaitu zona *kong*, zona bauksit, dan zona *latosol (overburden)*. Pembentukan bauksit dicirikan dengan meningkatnya kadar Al_2O_3 dan menurunnya kadar SiO_2 dan R- SiO_2 secara signifikan seiring dengan peningkatan intensitas lateritisasi yang merubah batuan dasar menjadi endapan bauksit. Batuan dasar diorit menghasilkan tipe bauksit *ferritic bauxite* dan batuan dasar diorit kuarsa menghasilkan tipe bauksit *bauxite – laterite* yang dicirikan dengan kehadiran mineral gipsit (56,69% – 74,77%) pada endapan bauksit. Ketebalan optimal endapan bauksit yang terbentuk sebesar 9,8 meter terdapat pada topografi laterit *hill slope* dengan kemiringan lereng landai (6% - 13%). Pencucian dilakukan dengan cara memisahkan bauksit menjadi beberapa fraksi ukuran butir. Pencucian bauksit bertujuan untuk menghilangkan kehadiran mineral lempung (nakrit, dikit, goethit, dan kaolinit) yang terkompaksi pada konkresi bauksit. Kadar Al_2O_3 optimal pada persebaran ukuran butir konkresi bauksit yang terkonsentrasi di sekitar nilai rata-rata frekuensi ukuran butir (tipe kurtosis *leptokurtic*) dengan rata-rata kadar Al_2O_3 46,45 wt.% dan fraksi >1cm (+1cm – +25cm) dengan rata-rata kadar Al_2O_3 46,30 wt.% dibandingkan persebaran ukuran butir konkresi bauksit yang tidak terkonsentrasi di sekitar nilai rata-rata frekuensi ukuran butir (tipe kurtosis *platykurtic*) dengan rata-rata kadar Al_2O_3 44,23 wt.% dan fraksi ukuran >1,68mm (+#12) dengan rata-rata kadar Al_2O_3 39,84 wt.%. Pencucian bauksit menghasilkan penambahan kadar Al_2O_3 sebesar 8,53 wt.% dan pengurangan kadar SiO_2 sebesar 17 wt.% dan kadar R- SiO_2 sebesar 3,43 wt.%.

Kata kunci: Bauksit, Konkresi, Optimasi, Ukuran butir, Pencucian bauksit, Natai

ABSTRACT

Bauxites are the main deposits that produce aluminium ores. During bauxites mining activities, optimization is required to improve the quality of bauxites mining products. One of the efforts to optimize the quality of bauxites before it is extracted into aluminum metal is bauxites washing. This study aims to determine the characteristics of bauxites and the influence of bauxites concretion grain size distribution as the result of bauxite washing on Al_2O_3 content in the vertical profile of bauxite in the Natai area, Tayan District, Sanggau Regency, West Kalimantan Province. The research analysis methods used on bedrocks and bauxites concretion are petrography, XRD (X-ray Diffraction), XRF (X-ray Fluorescence), and particle size distribution. Based on the research results, the formation of bauxite in the Natai area is divided into three horizon zones, which the kong zone, the bauxite zone, and the latosol (overburden) zone. The formation of bauxite is characterized by an increasing grade of Al_2O_3 and a decreasing grade of SiO_2 and R- SiO_2 significantly) along with an increase of lateritization intensity which changes the bedrock into bauxite deposit. Diorite bedrock produces the ferritic bauxite type and quartz diorite bedrock produces bauxite and laterite type, which are characterized by the presence of gibbsite minerals (56.69% - 74.77%) in bauxite deposits. The optimal thickness of the bauxite deposit is 9.8 meter on gentle slopes (6% - 13%) of laterite topography (hill slope). Bauxite washing aims to separate bauxite concretion into several grain size fractions. Bauxite washing is carried out to remove the presence of clay minerals (nacrite, dickite, goethite, and kaolinite) which are compacted together with bauxite concretion. The Al_2O_3 contents will be optimal on grain size distribution which is concentrated around the mean grain size frequency value (the leptokurtic type of kurtosis) with an average Al_2O_3 grade of 46.45 wt.% and >1cm fractions (+1cm – +25cm) with an average Al_2O_3 grade of 46.30 wt.%, compared with grain size distribution which is not concentrated around the mean grain size frequency value (the platykurtic type of kurtosis) with an average Al_2O_3 grade of 44.23 wt.% and >1.68mm fractions (+#12) with an average Al_2O_3 grade of 39.84 wt.%. The results of bauxite washing were able to increase the Al_2O_3 grade by 8.53 wt.% and reduce the SiO_2 grade by 17 wt.% and R- SiO_2 grade by 3.43 wt.%.

Keywords: *Bauxites, Concretion, Optimization, Grain size, Bauxite washing, Natai Area*