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Abstract Index

Bambang Yunianto (R&D Centre for Mineral and Coal Technology)
Analysis of small-scale mining in Mineral and Coal Mining Law Number 4/2009 (inputs for formulation of implementing regulation)
IMJ, Vol. 12, No. 3, October 2009, P. 97 - 104

Law Number 4/2009 on Mineral and Coal Mining has been approved by the DPR (the Indonesian Parliament) and issued by the government on January 12, 2009. Explicitely, small-scale mining is regulated by the law and the upcoming governmental decree that regulates its implementation to be issued in 2010, followed by the ministrial decree and regional regulation.

In the meantime, illegal mining activites (PETI - *Pertambangan Tanpa Izin*) reported everywhere in Indonesia. It reminds us on the case of tremendous environmental disaster due to illegal gold mine in Central Kalimantan, inconventional tin mine in Bangka Belitung, illegal coal mine in South Kalimantan, and illegal mine of industrial mineral (C Group minerals) in all areas in Indonesia.

The current question is will those dissaters happen again and can the Law Number 4/2009 prevents it from happening? Analysis on the law identifies that the law needs to be clarified with implementing regulations that, among others, regulate the small-scale's mining area, small-scale mining authorization, the right and responsibility of mining authorization holder, transfer of authority to head of district, the right of mining authorization holder over the land, etc.

Keywords: illegal mining, environmental disaster, Law Number 4/2009, and regulation of implementation

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Alteration of Montmorillonite Clay to Solid Acid Catalyst by Heating and Acid Soaking
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Commercial biodiesel production nowadays still uses sodium hydroxide solution as homogenous catalyst. This catalyst has some weaknesses, which cannot be reused and difficult on its separation from the product (methyl esther). Therefore, alternative catalyst is necessary to be sought to solve the problem and solid catalyst from clay has a possibility to be applied. Montmorilonite clay is widespread mineral in Indonesia and its layer structure is potential to be used as solid catalyst. The alteration processes consist of upgrading montmorillonite content followed by activation and esterification to review its performance. Previous activation was carried out using aqueous sulphuric acid of 0.05; 0.5; 5 and 10 M and settled in each solution for two weeks. To obtain shorten activation time, modified method has been done with similar acid strength range but using preheating 60°C for 6 hours and settled within a week. Clay's performance was observed by esterification reaction using Palm Fatty Acid Distillate (PFAD) of fried oil production waste as raw material. Its initial and final acid number were then reviewed. The conversion of PFAD to esther was measured from deviation of initial of final acid number. Previous method's result of 2 weeks settlement showed maximum conversion of 91.6% at 5M acid strength of activation, while modified method reached maximum conversion only 67.63% at similar acid strength of activation. Both results were not yet resemble the 5M sulphuric acid solution as homogenous catalyst which is able to convert PFAD to esther as much as 98.73%. However, the method of 2 weeks settlement could be developed further to gain the optimum conversion.

Keywords: solid catalyst, montmorilonite clay, activation, acid number, conversion

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Petrographic Study on Genesis of Selected Inertinite-Rich Coals from Jambi Subbasin
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Genesis of the coal macerals in the studied area depends particularly on the tectonic and geologic setting. The coals formed in the Jambi Subbasin, which is the back-arc basin associated with the fluvial to deltaic environment results in both rich in vitrinite and inertinite contents. The vitrinite content is associated with the bright lithotype deposited in the wet-swampy area; whereas the inertinite is associated with the dull lithotype deposited in the dry-swampy area. The presence of mineral matter causes the dull lithotype as well. The presence of the liptinite maceral cannot be correlated with the lithotypes. This maceral composition is the extreme phenomenon, because most of the Sumateran coals contain very low inertinite content (<5%) with very high vitrinite content (>80%). The coals contain low ash and low (0.1-0.4%) to medium

sulphur (1.3-1.6%) contents. The above evidence is the answer of the extreme evidence, and this is the objective of presenting this paper.

Methods applied in this study include in-situ coal sampling for microscopic analyses, which are petrographic determination and reflectance examination. The samples were also analysed for their proximate according to ASTM (2002).

Keywords: coal, inertinite, Jambi Subbasin, petrographic analysis

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Study on Conversion of Subsidized Kerosene as Fuel to Coal at Tobacco Drying Industry in Nusa Tenggara Barat (NTB) Province
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P. 118 - 123

In the last two years, a regulation on conversion of kerosene as subsidized fuel to alternative fuel for tobacco drying industry in NTB Province was issued. Coal as alternative fuel has a significant role in the conversion process. The process has been smoothly implemented due to advantageous condition like technical and economic aspects, supplier, port, and transporting structure and infrastructure. For 2007, 9,450 tons of coal has been consumed equal to conversion of 4,725 kilolitres (kl) of kerosene, making up the saved subsidy of IDR 16.112 billion. For 2011, coal consumption is predicted to reach 48,420 tons or convert 24,210 kl kerosene with the saved subsidy amount of IDR 82.556 billion. The amount can be doubled, if the conversion uses coal 100%. From the economic analysis, the efficiency of using coal as fuel is 28.4%, which equals to IDR 980 per kg. By using liquid petroleum gas (LPG), the cost for fuel will increase by 32.62% or equals to IDR 1,126 per kg.

Keywords: conversion, kerosene, coal, efficiency

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Study of Polymethacrylate (PMA) Influence as Dispersant on UBCWM Preparation
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P. 124 - 131

Upgraded brown coal water mixture (UBCWM) is a mixture of coal resulted from upgraded brown coal (UBC) process with water in a certain ratio to form a homogeneous and stable suspension during storage, transportation and combustion. UBCWM can be used as direct fuel as substitute for heavy fuel oil, particularly in industrial boilers. To obtain a UBCWM with high coal concentration and low apparent viscosity as well as good flow characteristics, the addition of additive as dispersant is needed. To study the effectiveness of polymethacrylate (PMA) as dispersant, research on the effect of PMA in the production of UBCWM needs to be carried out. The research was conducted by preparing UBCWM with the addition of PMA of 0.1, 0.3 and 0.5% and also carboxymethyl cellulose (CMC) of 0.01% as stabilizer. Preparation of UBCWM using 0.3% PMA and CMC, xantham gum (S- 60) and ransham gum (S-194) of 0.01% each was also carried out. Flow characteristic of the UBCWM was measured by using a viscometer at various shear rate. Results indicate that the addition of 0.3% PMA in the production of UBCWM is effective as dispersant. The addition of 0.5% PMA did not significantly reduce apparent viscosity. The addition of 0.3% PMA together with 0.01% CMC produces UBCWM with the highest coal concentration of 58.3% with yield stress of 23.22 Pa.

Keywords: polymethacrylate, dispersant, coal slurry, UBCWM

Husaini and Stefanus S. Cahyono (R&D Centre for Mineral and Coal Technology)
Flotation of Galena Ore from Sukabumi Using Aerofloat 241
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P. 132 - 138

The sample used for this research is lead ore composed of minerals of galena, pyrite, sphalerite, and quartz with a chemical composition of Pb 4.97 %, Cu 0.08 %, and Zn 6.24 %. The objective of the research is to increase lead content in the concentrate using flotation method. Lead ore was ground to less than 60 mesh mixed with water to form slurry and added with Na_2CO_3 to adjust pH of the slurry. Collector (AFL 241) and frother (Aerofroth 73) were then added successively and finally the slurry was aerated. The flotation experiments were performed using variables of collector dosage of 50-250 g/t, frother of 15-26.25 g/t, solid percentage of 20-35 % and pH of 7.5-10.5. In addition $ZnSO_4$ and NaCN were used as a depressant. The result showed that flotation experiment using the collector dosage of 50 g/t, frother of 15 g/t, solid percentage of 20%, and pH of 8.5 achieved maximum content of Pb in the concentrate with a chemical composition of Pb 42.94 %, Cu 0.27 %, and Zn 10.50 %, and the recoveries of Pb, Cu, and Zn were 60.90 %, 19.48 %, and 11.57 %, respectively.

Keywords: galena, froth flotation, leads, aerofloat 241