

Abstract Index

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The Application of Failure Method Probability for Analyzing In Pit Dump Stability at West Block 'X' Pit PT Berau Coal – East Kalimantan
Aplikasi Probabilitas Longsor untuk Menganalisis Kestabilan Timbunan In-pit di Pit West Blok 'X' – PT Berau Coal, Kalimantan Timur
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West Block 'X' pit is one of the coal mining locations operated by the Lati Mine Operation – PT Berau Coal. Administratively, the Lati Mine is located as part of Berau Regency – East Kalimantan. The study area is located at the north side of the concession, in a syncline fold structure zone. The disposal design in this area needs to special attention from slope stability aspect due it is located on the wing of a mega syncline with a certain slope and constituent of unconsolidated materials. The pit design needs to be stable. The purpose of this study is to determine the level of stability of the in-pit dump by analyzing the current in-pit dump stability based on the value of the safety factor (FS) and the probability of failure (PoF). The method used in this study is a probabilistic analysis of slope stability based on the Morgenstern-Price method to obtain the value of the safety factor and the probability of failure. The study results show that the slope is in the safe category (stable slope) in the range of PoF values 0 – 1%, marginal slope 1 – 12%, and unstable slope above 12%. Based on such as results, it is necessary to modify the slope geometry categorized as unstable to carry out mine operation safely underneath the toe of slope.

Keywords: In-pit, probabilistic, probability of failure, safety factor, syncline

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Growth and Production of Tea Plant (*Camellia sinensis* (L.) O Kuntze) after Pruning with Bio-organomineral Ameliorant
*Pengujian Amelioran Bio-organomineral Terhadap Pertumbuhan dan Produksi Tanaman Teh (*Camellia sinensis* (L.) O Kuntze) setelah Pangkas*
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Tea plant (*Camellia sinensis* (L.) O Kuntze) is one of the important plantation commodities that has long been cultivated in Indonesia. Mineral based ameliorant fertilization is one of the important factors to produce high productivity and maintenance of healthy plants. Ameliorant bio-organomineral (BIOM) is a fertilizer that

utilizes mineral resources, potential microbes, and organic matter. This study aimed to determine the effect of BIOM's ameliorant on plant health and tea productivity after pruning. The Randomized Block Design (RBD) was accomplished by 8 treatments and three replications (100% conventional fertilizer, 100% BIOM, 80% single fertilizer + 100% BIOM, 80% conventional fertilizer + 80% BIOM, 80% conventional fertilizer + 60% BIOM, 60% conventional fertilizer + 100% BIOM, 60% conventional fertilizer + 80% BIOM, and 60% conventional fertilizer + 60% BIOM). The results showed that there was a significant effect of the combination of conventional fertilizer and BIOM ameliorant on shoot production and pekoe percentage, but not significantly different in tipping production, pekoe shoot ratio and banji shoots. The combination of 60% conventional fertilizer and 60% BIOM showed the highest total production of 31.81 kg/plot. Shoot production in the BIOM treatment was 17.36% higher than that of the conventional fertilizer application. The application of BIOM ameliorant was able to improve the plant health after pruning on the GMB 7 clone.

Keywords: bio-organomineral, plant health, shoot production, tea plant, West Java

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Nurjaman, Fajar; Sari Yuliana; Handoko, Anton S.; Bahfie, Fathan; Herlina, Ulin; Miftahurrahman, Muhammad; Priadi, Dedi and Suharno, Bambang (Department of Metallurgy and Materials Engineering, Universitas Indonesia; Research Unit for Mineral Technology, National Research and Innovation Agency)
Effect of Sulfur in the Reductants on Sulfidation Mechanism of Nickel Laterite
Pengaruh Sulfur dalam Reduktan Terhadap Mekanisme Sulfidasi Bijih Nikel Laterit
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Processing nickel laterite conventionally, namely by pyrometallurgy method, requires high temperature and energy, results in a costive process. Due to its lower temperature reduction process, selective reduction with additives could be an alternative in nickel ore processing. Additives such as sulfur/sulfate have a critical role in promoting the low melting point phase. Sulfur is also found in coal. Therefore, it is important to investigate the effect of sulfur content in reductant on selective reduction of lateritic nickel ore. In this work, the effect of sulfur content (2.68% and 5% S) in anthracite coal as a reductant on selective reduction of limonitic ore was studied clearly. Nickel ore, reductant and sodium sulfate were mixed homogenously and pelletized up to 10-15 mm in diameter. Pellets were reduced using a muffle furnace at 950 to 1150°C for 60 min. Reduced pellets were crushed into -200 mesh before separating the ferronickel and its impurities using a wet magnetic separation process. The result showed that the anthracite coal with 5% S produced concentrate containing 3.56% Ni with 95.97% recovery, which is higher than 2.68% S. The sulfur content in reductant

<p>could replace the addition of sulfur/sulfate as the additives in the selective reduction of lateritic nickel ore.</p> <p>Keywords: selective reduction, nickel laterite, reductant, sulfur, ferronickel</p>	<p>DOI: 10.30556/imj.Vol24.No2.2021.1242 Umar, Datin F. and Rohayati, Tati (R&D Centre for Mineral and Coal Technology) Study on Chemical Characteristics of Coal and Biomass Blend and the Tendency of Its Ash Deposition <i>Studi Sifat Kimia dan Kecenderungan Deposisi Abu Campuran Batubara dan Biomassa</i> IMJ, Vol. 24, No. 2, October 2021, P. 113-126</p>
<p>DOI: 10.30556/imj.Vol24.No2.2021.1234 Handoko, Slamet; Rianda, Sapta and Nurhadi (R&D Centre for Mineral and Coal Technology) Effect of Low Rank Coal Temperature and Moisture Content on Slow Pyrolysis Process <i>Pengaruh Suhu dan Kadar Air Batubara Peringkat Rendah Terhadap Proses Pirolisis Lambat</i> IMJ, Vol. 24, No. 2, October 2021, P. 105-111</p> <p>The government of Indonesia has made policies to increase the added value of coal. It can be completed using technology of slow pyrolysis. This study aimed to increase the added value of coal by analyzing the effect of temperature and water content of the feed on slow pyrolysis products. Water content variation in the feed form of coal was 10.57 wt% and 16.86 wt%. Temperature variations in the slow pyrolysis process were 500, 600, 700, and 800 °C. Result of this research showed that the low moisture content of coal produced more char in the slow pyrolysis process. Based on the variations of the used temperature, a higher temperature of pyrolysis produced fewer char but its calorific value of coal product was also higher. The optimum operating condition was achieved at 500-600 °C.</p> <p>Keywords: slow pyrolysis, water content, temperature, char quality, char energy content</p>	<p>A coal and biomasses of empty fruit bunch (EFB), mesocarp fiber (MF) and palm kernel shell (PKS) were characterized in terms of its proximate, ultimate, calorific value and ash chemical composition. Ash fusion temperature (AFT) was carried out on coal and biomass blends with a composition in weight % of 95-5; 90-10 and 85-15. The coal used in this research has high calorific value of 6,106 cal/g. Results indicate that based on the AFT, the coal-biomass blends at some composition shows a medium tendency to ash deposition. While based on the chemical composition, generally the coal-biomass blends have a low tendency to slagging but have a high tendency to fouling. Coal-biomass blend at the coal composition of 85 wt% and PKS of 15 wt% (85-15) is recommended to be applied. The less the coal is used, the less the CO₂ emission, so it is expected to reduce the GHG significantly.</p> <p>Keywords: biomass, proximate, ultimate, slagging, fouling</p>