

SARI

Lempung merupakan salah satu bahan galian industri yang banyak dimanfaatkan untuk berbagai bidang industri. Jawa Barat merupakan wilayah dengan produksi lempung yang cukup besar dengan jumlah produksi sebanyak $\pm 2,9$ juta ton per tahun. Salah satu daerah yang memiliki potensi lempung terletak di Desa Nambo yang dipilih sebagai daerah penelitian. Lokasi penelitian terletak di Desa Nambo, Kecamatan Klapanunggal, Kabupaten Bogor, Jawa Barat. Kondisi geologi yang cukup kompleks memungkinkan tersimpannya banyak sumber daya alam khususnya lempung di wilayah ini. Selama ini, pemanfaatan material lempung di daerah penelitian hanya dimanfaatkan untuk bahan baku semen *portland*. Penelitian ini dilakukan untuk mengetahui karakteristik material lempung di daerah penelitian sehingga dapat memberikan rekomendasi pemanfaatannya sebagai bahan baku pada beberapa jenis industri. Material lempung di daerah penelitian terdapat pada satuan morfologi perbukitan bekas tambang yang didominasi oleh satuan litologi batuserpih. Untuk mengetahui karakteristik fisik, maka dilakukan uji plastisitas, uji air pembentuk, uji ukuran butir, dan uji pembakaran yang dilakukan pada 3 sampel material lempung. Analisis XRD dan SEM dilakukan untuk mengetahui komposisi mineral penyusun pada material lempung di daerah penelitian. Selain itu, analisis geokimia dilakukan untuk mengetahui komposisi senyawa oksida utama pada 20 sampel material lempung di daerah penelitian. Material lempung di Daerah Nambo dicirikan dengan kehadiran mineral lempung seperti smektit, kaolinit, illit, dan mineral pengotor seperti kuarsa dan kalsit. Berdasarkan karakteristik geokimianya, material lempung di Daerah Nambo dicirikan dengan tingginya kandungan SiO_2 (40,93-68,26%) dan Al_2O_3 (9,96-19,75%), sedangkan kandungan senyawa Fe_2O_3 (3,39-6,38%), dan rendahnya kandungan senyawa CaO ($\leq 15,42\%$), MgO (1,52-2,05%), K_2O (1,17-2,11%), Na_2O (0,31-0,40%), dan SO_3 (0,38-3,36%). Adapun karakteristik fisik material lempung di daerah Nambo dicirikan dengan sifat plastisitas sedang-tinggi, air pembentuk sebesar 14,84-45,41%, dominasi ukuran butir lempung (44,19-53,61%), dan karakteristik setelah melalui proses pembakaran yang tidak membentuk massa gelas, pori-pori, gelembung, tidak terbentuknya homogenitas leburan, homogenitas warna yang merata, dan warna setelah dibakar menjadi coklat muda. Berdasarkan karakteristik fisik dan kimia tersebut, dengan mengacu pada spesifikasi menurut Effendi (2004); Suhala (1997); Manning (1995); Murray (1997); Siddiqui (2005) dan Lopez-Galindo dkk. (2006), material lempung di daerah Nambo direkomendasikan sebagai bahan baku dalam industri semen, industri keramik gerabah, dan sebagai absorben pada industri kelapa sawit.

Kata kunci: Material Lempung, Nambo, Karakteristik, Industri, Pemanfaatan

ABSTRACT

Clay is one of the industrial excavation materials that is widely used for various industrial fields. West Java is a region with a large production of clay with a total production of ± 2.9 million tons per year. One of the areas that has clay potential is located in Nambo Village which was chosen as the research area. The research location is located in Nambo Village, Klapanunggal District, Bogor Regency, West Java. The fairly complex geological conditions allow the storage of many natural resources, especially clay in this region. So far, the use of clay materials in the research area has only been used for Portland cement raw materials. This research was conducted to determine the characteristics of clay materials in the research area so that it can provide recommendations for its use as raw materials in several types of industries. The clay material in the study area is found in the morphological unit of the denudational hills which is dominated by the lithological unit of shale. To determine the physical characteristics, a plasticity test, a forming water test, a grain size test, and a combustion test were carried out on 3 clay material samples. XRD and SEM analysis was carried out to determine the composition of constituent minerals in clay materials in the research area. In addition, geochemical analysis was carried out to determine the composition of the main oxide compounds in 20 samples of clay material in the study area. The clay material in the Nambo District is characterized by the presence of clay minerals such as kaolinite, smectite, illite, and impurity minerals such as quartz and calcite. Based on its geochemical characteristics, clay materials in the Nambo area are characterized by high content of SiO_2 (40.93-68.26%) and Al_2O_3 (9.96-19.75%), while the content of Fe_2O_3 compounds (3.39-6.38%), and low content of CaO compounds ($\leq 15.42\%$), MgO (1.52-2.05%), K_2O (1.17-2.11%), Na_2O (0.31-0.40%), and SO_3 (0.38-3.36%). The physical characteristics of clay materials in the Nambo area are characterized by medium-high plasticity, forming water of 14.84-45.41%, dominance of clay grain size ($\geq 44,19\%$), and characteristics after going through a combustion process that do not form glass masses, pores, bubbles, no formation of melting homogeneity, even color homogeneity, and color after burning to light brown. Based on these physical and chemical characteristics, with reference to the specifications according to Effendi (2004); Suhala (1997); Manning (1995); Murray (1997); Siddiqui (2005) and Lopez-Galindo et al. (2006), clay materials in the Nambo area are recommended as raw materials in the cement industry, ceramic pottery industry, and as absorbents in the palm oil industry.

Keywords: Clay Material, Nambo, Characteristics, Industry, Utilization