

SARI

Mineral lempung merupakan mineral industri yang paling penting di dunia khususnya pada bidang industri keramik dan konstruksi sehingga menjadikan studi tentang geologi dan karakteristik mineral lempung di Perbukitan Godean menjadi studi yang menarik, untuk mendukung industri tersebut dalam memberikan informasi ketersediaan bahan baku. Hal tersebut dikarenakan kualitas produk yang dihasilkan ditentukan oleh karakteristik mineral lempung. Karakteristik yang diteliti meliputi sifat mineralogi secara petrografi, XRD (*x-ray diffraction*) dan SEM (*scanning electron microscope*), sifat kimia dengan metode ICP-AES (*Inductively Coupled Plasma-Atomic Emission Spectroscopy*), serta sifat fisik dengan uji keplastisan, uji pembakaran pada suhu tinggi, uji ukuran fraksi butir, dan analisis air pembentuk. Secara geomorfologi daerah penelitian terdiri dari satuan dataran aluvial, satuan bukit intrusi dan satuan perbukitan intrusi. Daerah penelitian disusun oleh satuan batupasir, satuan diorit, dan endapan lempung – kerakal. Mineralogi lempung penyusun Perbukitan Godean adalah kaolinit, haloysit, ilit, smektit, monmorilonit. Hasil analisis geokimia, lempung daerah penelitian menunjukkan senyawa kimia SiO_2 (63,1% wt), Al_2O_3 (16,75% wt), Fe_2O_3 (4,84% wt), Na_2O (3,14 wt), K_2O (2,05% wt). Karakteristik fisik lempung di daerah penelitian memiliki sifat plastisitas rendah - sedang, persentase ukuran butir lempung berkisar antara 30,32 % - 38,08 %, hasil uji bakar menunjukkan warna setelah dibakar merah bata. Lempung dari daerah perbukitan Godean kurang memenuhi persyaratan sebagai bahan baku industri keramik khususnya porselin dan saniter, akan tetapi dapat dimanfaatkan sebagai bahan baku industri keramik gerabah halus, gerabah kasar dan agregat ringan (batubata merah dan genteng) dengan beberapa perlakuan seperti proses penghalusan butiran, penambahan mineral dan penambahan senyawa kimia tertentu. Jumlah air pembentuk yang direkomendasikan dalam pemanfaatan lempung di daerah Godean berkisar antara 24,15 % hingga 33,16 % untuk air pembentuk minimum dan berkisar antara 37,68 % hingga 43,22 % untuk air pembentuk maksimum.

Kata kunci : geologi, lempung, godean, keramik, gerabah, kaolinit, smektit, air pembentuk, plastisitas

ABSTRACT

Clay minerals is the most important industry in the world, especially in the industrial ceramics and construction so as to make the study of the geology and characteristics of clay minerals in the hills of Godean be interesting studies, to support the industry in providing information on the availability of raw materials. That is because the quality of the resulting product is determined by the characteristics of clay minerals. Characteristics examined included the nature of mineralogy in petrographic, XRD (x-ray diffraction) and SEM (scanning electron microscope), the chemical nature of the method ICP-AES (Inductively Coupled Plasma-Atomic Emission Spectroscopy), as well as the physical properties of the test plasticity, fire tests at high temperatures, the test size fraction of grain and water analysis formers. In geomorphology study area consisted of units of the alluvial plain, units hills intrusion and units hills intrusion. the study area was developed by the unit sandstone, unit diorite, and clay deposits - gravel. the mineralogy of clay making up the hills Godean is kaolinite , halloysit, smectite. The results of geochemical analysis, clays study area showed a chemical compound SiO_2 (63.1 wt%), Al_2O_3 (16.75 wt%), Fe_2O_3 (4.84 wt%), Na_2O (3.14 wt%), K_2O (2.05 %wt). the physical characteristics of clays in the study area has a low plasticity properties - currently, the percentage of clay grain size ranging between 30.32 % - 38.08 %, fuel test results show after the burnt red color brick. Clay from the hills Godean not meet the requirements as raw material for the ceramic industry, especially porcelain and sanitary ware, but can be used as raw material for industrial ceramics earthenware fine, pottery rugged and lightweight aggregate (brick red and tile) with several treatments such as smoothing process granules, Extra minerals and the addition of certain chemical compounds. The amount of water forming recommended in the use of clay in Godean ranged from 24.15 % to 33.16 % for minimum forming water and ranged from 37.68% to 43.22 % for the maximum forming water.

Keywords: geology, clay, godean, ceramics, pottery, kaolinite, smectite, forming water, plasticity