ABSTRAK

PENGARUH VARIASI BIJIH BESI (SEBAGAI SUBSTITUSI PASIR) DAN WAKTU PERENDAMAN TERHADAP KOMPOSISI, STRUKTUR FASE DAN SIFAT FISIS PADA PEMBUATAN MORTAR

Oleh

Ibnu Hambali

Mortar merupakan campuran yang terdiri dari pasir semen dan air. Bijih besi dimanfaatkan untuk substitusi pasir sebagai agregat halus pada pembuatan mortar dengan variasi 0% (standar), 50%, 60%, 70%, 80%, 90% dan 100%. Bahan-bahan tersebut dicampur hingga homogen, dicetak dengan ukuran 5x5x5 cm^3 kemudian didiamkan selama 24 jam, dan direndam selama 7, 14, 21 dan 28 hari. Karakterisasi mortar meliputi analisis XRF dan XRD serta uji fisis meliputi massa jenis, porositas, absorpsi dan kuat tekan. Mortar standar dengan perendaman 28 hari diperoleh kuat tekan 16,31 MPa, pada kadar bijih besi 60% diperoleh kuat tekan terbesar 20,97 MPa, dan pada kadar bijih besi 100% diperoleh kuat tekan terkecil 11,67 MPa. Karakterisasi mortar dengan kuat tekan terbesar menunjukkan bahwa fase tertinggi yang terbentuk yaitu *microline ordered* ($K(AlSi_3O_8)$), *hematite* (Fe_2O_3), *quartz* (SiO_2) dan karakterisasi mortar dengan kuat tekan terkecil menunjukkan bahwa fase tertinggi yang terbentuk yaitu grossular ($Ca_3Al_2Si_3O_{12}$) *hematite* (Fe_2O_3), *quartz* (SiO_2). Mortar dalam penelitian ini termasuk dalam kategori mortar tipe M karena memiliki kuat tekan tertinggi di atas 17,2 MPa.

Kata kunci: bijih besi, karakterisasi. pasir, sifat fisis, substitusi.

ABSTRACT

THE EFFECT OF VARIATION IRON ORE (AS A SUBSTITUTE FOR SAND) AND IMMERSION TIME ON THE COMPOSITION, PHASE STRUCTURE AND PHYSICAL PROPERTIES OF MORTAR MAKING

By

Ibnu Hambali

Mortar is a mixture consisting of sand, cement and water. Iron ore is used to substitute sand as fine aggregate in the manufacture of mortar with variations of 0% (standard), 50%, 60%, 70%, 80%, 90% and 100%. The materials were mixed until homogeneous, printed with a size of 5x5x5 cm^3, then allowed to stand for 24 hours, and soaked for 7, 14, 21 and 28 days. Mortar characterization includes XRF and XRD analysis and physical tests include density, porosity, absorption and compressive strength. Standard mortar with 28 days of immersion obtained a compressive strength of 16.31 MPa, at 60% iron ore grade the largest compressive strength was 20.97 MPa, and at 100% iron ore grade the smallest compressive strength was 11.67 MPa. The characterization of the mortar with the highest compressive strength showed that the highest phase formed was *microline ordered* ($K(AlSi_3O_8)$), *hematite* (Fe_2O_3), *quartz* (SiO_2) and the characterization of the mortar with the smallest compressive strength showed that the highest phase formed was *grossular* ($Ca_3Al_2Si_3O_{12}$) *hematite*. (Fe_2O_3), *quartz* (SiO_2). The mortar in this study is included in the category M type mortar because it has the highest compressive strength above 17.2 MPa.

Keywords: *iron ore, characterization, sand, physical properties, substitution*