

ABSTRAK

PENGARUH VARIASI KOMPOSISI ABU TANDAN KOSONG KELAPA SAWIT, POLIMER EVA DAN SUHU TERHADAP PEMBUATAN MORTAR GEOPOLIMER

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Telah dilakukan penelitian pengaruh variasi komposisi abu tandan kosong kelapa sawit, polimer eva dan suhu terhadap pembuatan mortar geopolimer dibuat dengan mencampurkan abu tandan kosong sawit, polimer EVA, NaOH, Na_2SiO_3 dicetak dalam bentuk balok $4 \times 4 \times 16 \text{ cm}^3$ dan dioven dengan suhu 60°C dan 80°C selama 5 jam. Sampel mortar geopolimer lalu diuji kuat lentur dan memperoleh nilai kuat lentur tertinggi pada sampel GM3 suhu 80°C sebesar 18,9 MPa. Hasil XRF dan SEM-EDS menunjukkan dominasi senyawa SiO_2 dan CaO yang berkontribusi terhadap kekuatan struktur mortar. Hasil XRD mengidentifikasi fasa utama sebagai quartz (SiO_2) dan corundum (Al_2O_3). Hasil FTIR mengidentifikasi ikatan hidroksil (-OH), C-H, dan Si-O-Al. Penambahan polimer EVA terbukti memberikan pengaruh signifikan terhadap peningkatan kuat lentur mortar geopolimer, dapat kita lihat pada variasi ketiga dengan penambahan 1,8% EVA pada suhu 80°C yang mencapai 18,9 MPa, dibandingkan dengan sampel tanpa EVA yang hanya memiliki kuat lentur 1,2 MPa.

Kata Kunci : Mortar geopolimer, suhu.

ABSTRACT

THE EFFECT OF COMPOSITION VARIATIONS OF EMPTY PALM FRUIT ASH, EVA POLYMER AND TEMPERATURE ON THE PRODUCTION OF GEOPOLYMER MORTAR

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A study has been conducted on the effect of variations in the composition of empty oil palm fruit bunch ash, EVA polymer and temperature on the manufacture of geopolymer mortar made by mixing empty oil palm fruit bunch ash, EVA polymer, NaOH, Na₂SiO₃ molded in the form of 4 x 4 x 16 cm³ blocks and oven-dried at 60°C and 80°C for 5 hours. Geopolymer mortar samples were then tested for flexural strength and obtained the highest flexural strength value in the GM3 sample at 80°C of 18.9 MPa. XRF and SEM-EDS results showed the dominance of SiO₂ and CaO compounds which contributed to the strength of the mortar structure. XRD results identified the main phases as quartz (SiO₂) and corundum (Al₂O₃). FTIR results identified hydroxyl (OH), Si-O, and Si-O-Si bonds. The addition of EVA polymer has been proven to have a significant effect on increasing the flexural strength of geopolymer mortar, as can be seen in the third variation with the addition of 1.8% EVA at a temperature of 80°C which reaches 18.9 MPa, compared to the sample without EVA which only has a flexural strength of 1.2 MPa.

Keywords: Geopolymer mortar, temperature