EXPERIMENTAL STUDY OF MAKING ECOCEMENT FROM ORGANIC WASTE ASH AND CLAM SHELL AS ALTERNATIVE MATERIAL FOR CEMENT REPLACEMENT

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Abstract
Ecocement has been made successfully from the basic materials are organic waste ash and clamshell ash. Organic waste ash is burned by incinerator at a temperature of 1000°C. Clamshell is heated by furnace at 700°C temperature. Initial composition of the test results with XRD (X-Ray Diffraction), organic waste ash containing 69.7% CaCO₃; 12.1% KCl; Cd₀.₁₅Gd₀.₈₅ 4%; 3% SiO₂; 8.1% Fe (S₀.₅Tₑ₀.₅) and 3% Al₂ErGe₂, clam shell ash contains 100% CaCO₃. Three variations of ecocement are made for this research, the amount composition of organic waste ash : clamshell ash are Ekosemen A (58.2%: 40%); Ekosemen B (49.1%: 49.1%) and Ekosemen C (54.01%: 44.09%). As a control variable is used Portland Cement type OPC (Ordinary Portland Cement) from brand 'Semen Gresik'.

The Chemical testing for ecocement are insoluble, SO₃, SiO₂, R₂O₃, CaO, MgO, loss of ignition, and Fe₂O₃ in all type of samples. The physics testing that have been done are mortar compressive strength and density of the powder. XRD testing was conducted to determine the chemical composition of ecocement. From the results of chemical testing and powder density obtained ekosemen B has closest characteristic to 'Semen Gresik' OPC, the value are insoluble (11.358%), SO₃ (1.0633%), SiO₂ (10.565%), R₂O₃ (12.94%), CaO (42.756%), MgO (1.9837%), loss of ignition (30.896%), Fe₂O₃ (3.6012%), pressure test on 3 days age (7.2 kg/cm²) and powder density (2.535 gr / ml).

Keywords: Portland cement, Ecocement, Organic waste ash, Clam shell