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| Thesis Title    | Effect of Calcium Chloride on Concrete Made from Calcium Carbide Residue and Rice Husk Ash as Cementitious Material |
| Thesis Credits  | 12  |
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#### Abstract

The objective of this research is to investigate the effect of calcium chloride on the compressive strength of concrete that utilizes calcium carbide residue and rice husk ash as a cementitious material. Calcium carbide residue which is a by-product of the acetylene gas production is mixed equally by weight with the rice husk ash. In this experiment, calcium carbide residue was ground until the remaining on sieve No.325 not exceed 30 percents by weight. Similarly, the rice husk ash, was also ground until the remaining on the same sieve not exceeding 10 percents by weight. After finishing material preparation, the chemical and physical properties were tested. Concrete cylinders of 10 cm in diameter and 20 cm height were cast and tested for compressive strength at the age of 1, 3, 7, 14, 28, 60, 90, and 180 days. In addition, modulus of elasticity of concrete was measured at the age of 28 and 180 days.

The test results indicated that the pastes of calcium carbide residue and rice husk ash as cementitious material had longer setting times than that of cement paste. Compressive strength was also lower than that of cement-concrete and was approximately 25 percents of cement-concrete at 28-day when the concrete had the same mix proportion. The maximum compressive strength at 28-day was 177 ksc and developed to be 192 ksc at 180-day. Comparison between these two types of concretes it was indicated that the strength development was similar. Strength development was high at the first 14 days and decreased later on. In addition, the compressive strength increased as water to cementitious material ratio decreased. Tested results also illustrated that utilization of calcium chloride as an admixture increased

slump of concrete and prolonged both initial and final setting times. However, the compressive strength of concrete reduced as the calcium chloride increased. Furthermore, concrete using calcium carbide residue and rice husk ash as cementitious material had modulus of elasticity almost equal to the normal concrete when the strength was the same range but was lower in case of utilization of calcium chloride in the mixture. From this study, the strength of concrete that used calcium carbide residue and rice husk ash as the cementitious material could reach the sufficient strength which was suitable for application in some construction.

Keywords : Calcium Carbide Residue / Rice Husk Ash / Calcium Chloride / Cementitious  
Material / Admixtures