

INVESTIGATIONS ON THE PROPERTIES OF MAGNESIUM OXYCHLORIDE CEMENT PRODUCED BY IN SITU AND CLASSIC METHODS

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ABSTRACT

In this research, magnesium oxychloride cement was produced by two methods, one with a classic method by using $MgCl_2$ in MgO - $MgCl_2$ - H_2O system and the other one with in situ method by using HCl in ternary system of MgO - HCl - H_2O . The compressive strength of the cements was measured after the 10th day. The comparison of the mechanical properties of the cements showed that the cement which was produced by the classic method, MgO - $MgCl_2$ - H_2O , had low strength properties with respect to the in situ cement, MgO - HCl - H_2O , with the same composition. In situ production of magnesium oxychloride cement was significantly related to the heat reaction of MgO with HCl and setting time of the cement. The strength development of the cement which was produced by in situ method was due to the optimum formation of the needle shaped crystals of phase $5MgO \cdot MgCl_2 \cdot 8H_2O$ in cement system. The morphology and microstructure of the phases were characterized by using scanning electron microscope (SEM). Bulk densities were also measured. X-Ray diffraction (XRD) of matrix phases was investigated.

KEY WORDS: Magnesium oxychloride cement; Needle shaped crystal; In situ; Setting time; Strength
