# Chloride Ion Binding of Aluminates and Cements Influenced by Steam Curing

K. Kopecsko[1], Gy. Balazs[1], F.D. Tamas[2]
[1]*Technical University, Budapest, Hungary;*
[2]*Pannon University, Veszprem, Hungary*

The chemically bound chloride content does not induce corrosion of steel reinforcement. Main purpose of our research was to study both the hydration and chloride ion binding mechanisms of non steam-cured and steam-cured $C_3A$ and $C_4AF$ cement clinkers in presence of gypsum. Hydration of steam-cured $C_3A$ and $C_4AF$ cement clinkers and their mixtures with gypsum (up to 10/5 mass ratio) were investigated as well as their chloride ion binding mechanisms by thermal tests (TG/DTG/DTA) and X-ray diffraction. The other series of samples were made of cements (OPC, GGBSC and SRPC). The hardened samples were cyclically immersed in 10 m% NaCl solution (for 1 day) then kept at 100% relative humidity (for 1 day) between the age of 28 and 38 days, respectively. Tests were carried out at the ages of 1, 7, 28, 90 and 180 days. The hardened cement specimens were subjected to compressive tests. After salt-treatment the amount of hydrogarnet decreased. Chlorides were bound in form of Friedel's and Kuzel's salt by samples prepared from $C_3A$ or $C_4AF$ in presence of gypsum. Increase of gypsum content decreased the forming of Friedel's salt. Both Kuzel's salt and Friedel's salt were detectable in samples aluminates/gypsum 10/1 10/2 and 10/3. Formation of solid solution of phases was also observed. Both non-steam cured and steam cured samples at 60 and 90°C indicated decreasing tendency for the formation of Friedel's salt with the increased amount of gypsum. We observed in steam cured and salt treated samples higher amounts of Friedel's salt than in non-steam cured samples.