Experimental study on surface alteration of mortars reacted with seawater

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This study aims to elucidate the alteration mechanism of **mortar** surface reacted with **seawater** and the relationship between characteristics of secondary products on the surface and salt concentration of seawater. The experiment was carried out in closed system using two kinds of mortars which were made from **high-early-strength portland cement (HES)** or **alumina cement (AL)** and silica sand, and two kind of artificial seawater with half and twice of salt concentrations. Tablet type specimen (3.5-cm diameter, 1.0-cm height) was treated with seawater of 200.0 mL at 25.0^{o}C during 91 days. Results of the experiment showed that the thin layer is formed by crystallized white products on the surface of altered tablet. This was characterized by SEM and XRD as particle or petal shaped **brucite: Mg(OH)**$_2$ and column or needle shaped **aragonite: CaCO**$_3$. Under high salt concentration of seawater the production of brucite and aragonite was promoted. Besides, analysis of cross section of altered tablet illustrated that brucite is formed at first and then aragonite is formed. Production of brucite was remarkable at HES, while that of aragonite was remarkable at AL.