# Effect of Thiosulfate on the Passivation of Zinc-Alloys in 3.5 wt% NaCl Solution at 353 K

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The effect of thiosulfate ($S_2O_3^{2-}$) with the different concentrations (100 g $m^{-3}$, 150 g $m^{-3}$, 200 g $m^{-3}$) on the passivation of Zn alloys in artificial seawater at 353 K is investigated by using immersion tests, electrochemical measurements, and field emission scanning electron microscopy (FE-SEM) with EDX. It is found that the presence of thiosulfate in the solution can hinder the passivation. Potentiodynamic polarization results show that thiosulfate increases the current density at which the thin passive films with the low corrosion resistance are formed. Thiosulfate effect to retard the passivation, is different with the concentrations exposed to the respective Zn alloys based on the Al content. Due to the presence of various Zn and Al protective compounds at the surface, the passivation of Zn alloys occurs at the immersion time of 432 ks in the form of thin film. After the immersion time is 1037 ks, the passivation is still approximately as close as 432 ks inhibiting the filmgrowth by the effect of thiosulfate and depassivation also would be occurred with the removal of the oxide thin film by the longer immersion time.