

**A Study on the Inhibition of Pitting Corrosion of Pure Aluminium by  $\text{SO}_4^{2-}$  and  $\text{MoO}_4^{2-}$**

$\text{SO}_4^{2-}$ 과  $\text{MoO}_4^{2-}$ 에 의한 순수 알루미늄의 공식 억제에 관한 연구

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It has been generally known that irregular electrochemical current fluctuations on metals with protective oxide films, such as iron, stainless steel and aluminium, occur due to stochastic events associated with initiation, growth, or passivation of corrosion pits. In recent years, this electrochemical noise has been extensively studied on a number of metal and alloy systems because of its good applicability for monitoring, as well as studying corrosion processes. Therefore, in this work, the inhibitive effects of sulphate and molybdate on pitting corrosion in pure aluminium were studied in chloride solution as a function of anion concentration by using potentiodynamic polarisation experiment and electrochemical noise measurement. Electrochemical current noise of pure aluminium was measured under potentiostatic control. In the experiment, since stationarity is required for statistical and spectral analysis, current was allowed to reach steady state before it was recorded with time. Power spectral densities calculated by fast Fourier transforms and a statistical method were used for the analysis of the current time series. From the statistical analysis of current noise, it was shown that the addition of sulphate or molybdate ions reduced both the numbers and sizes of current spikes. In the spectral analysis, the inhibition efficiency of anions against pitting corrosion was quantitatively determined by employing the roll-off slope of the spectrum. Based upon the results, it was proposed that both anions act as inhibitors on pit initiation of aluminium by competitive adsorption mechanism.

**References**

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