Electrochemical Behavior of ZE41 Magnesium Alloy under Simulated Atmospheric Corrosion

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The electrochemical measurement technology such as cathodic polarization curves, electrochemical impedance spectroscopy (EIS) and electrochemical noise (EN) were used to study the corrosion behavior of ZE41 magnesium alloy in bulk solution and under thin electrolyte layers (TELs) containing 3.5 wt. % NaCl. The electrochemical results indicate that the corrosion resistance of ZE41 under the TELs is enhanced compared to that in bulk solution. Moreover, in bulk solution uniform corrosion preferentially occurs and with the immersion time localized corrosion also arises, while under the TELs localized corrosion is the primary corrosion form which occupies higher ratio compared to uniform corrosion and with the thinning of the TELs and increasing of immersing time the ratio becomes higher.

Keywords: ZE41 Magnesium Alloy; EIS; Electrochemical Noise; TEL; Corrosion Resistance; Corrosion Form.

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