

## Deep Analysis on EIS Data for Corrosion Resistant Materials Design and Corrosion Evolution Studies

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**Abstract:** In this talk, a discussion on EIS data for corrosion resistant materials design and corrosion evolution studies will be presented based on the recent progress in our lab. First, the impedance response by an oxide film on metals can be interpreted in terms of in-depth distribution of electrical properties, and thus by suitable analyzation in EIS data the film thickness and resistivity distribution inside the oxide film can be derived based on exponential or power-law distributions in resistivity [1]. Based on this, a corrosion resistant oxide film may be a key in developing corrosion-resistant Pb-free Sn-based solders. Moreover, EIS has been employed to understand the degradation behavior of a rust-preventive oil in contact with NaCl electrolyte, with a focus on analyzing the electrochemical responses that correspond to a different frequency range in the obtained EIS spectra [2]. Besides, EIS is a powerful characterization method to unravel the electrochemical process in timescale, and EIS has been found as a powerful tool in analyzing the adsorption and desorption behavior of corrosion inhibitors under acid conditions.

**Keywords:** Corrosion Electrochemistry; Corrosion Resistant Materials Design; Inhibitors Adsorption and Desorption

### Reference

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