Deciphering the code for the surface treatment of Mg alloys—from the theory of total acidity ratio to the dissolution-ionization-diffusion-deposition model

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Abstract Improving the corrosion resistance of Mg alloys by surface treatment processes are indispensable for industrial applications. Various chemicial conversion coatings, plasma elextrolytic oxidation coatings and electroless nickel plating coatings had been proposed. But the idea that supports the design of interactions between the Mg alloy and the treatment bath constituents has not been revealed. Most Edisonial approaches could contribute to the improvement of these processes, but to a limited extent. In this lecture, we will introduce some new pespective to decipher the interactions during the corrosion and surface treatment of Mg alloys, and the design of high corrosion resistant phosphate conversion coatings and self-densified plasma elextrolytic oxidation coatings were selected as examples to demonstrate the applicability of the theory of total acidity ratio to the dissolution-ionization-diffusion-deposition model.

Keywords Corrosion; Mg alloy; surface treatment;

Reference

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