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Evolution of corrosion resistance and passive film properties of Ni-Mo alloy coatings during exposure to 0.5 M NaCl solution

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Abstract

The corrosion properties of Ni-Mo alloy coatings with different molybdenum content (11-32 wt.%) were investigated in the course of exposure to 0.5 M NaCl solution. Polarization resistance and impedance measurements showed that after contact with corrosive media, the formation of passive film on the coating surface, determines the corrosion resistance of Ni-Mo alloys. XPS analysis revealed that, the passive film growth was enhanced by the presence of higher amounts (26-28 wt.%) of Mo in the coating. It was found, that after exposure to corrosive solution, Mo oxides occurred at the passive film/metal interface, whilst Ni hydroxide dominated in the bulk of the passive film.

Keywords: Ni-Mo alloy, Electrodeposition, XPS, Passive film, LPR, EIS

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