Effects of Ultrasound on the Microstructure and Corrosion Behaviour of a PEO Coating

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The plasma Plasma electrolytic oxidation (PEO) coatings were prepared on pure aluminium with and without the assistance application of ultrasound, respectively. The effect of ultrasound on the coating microstructure, chemical and phase compositions, and on the corrosion resistance were investigated by means of using a the scanning electron microscope (SEM) equipped with an energy dispersive spectrometry (EDS), an X-ray diffractometer (XRD), potentiodynamic polarization and electrochemical impedance spectroscopy (EIS). The results showed that ultrasound could advance the dielectric breakdown time of the PEO coating, and homogenize the coating structure and the distributeion of Si elements in the coatings without affecting the phase composition. The corrosion resistance of the PEO coating was also improved by ultrasound.

Keywords: plasma electrolytic oxidation; ultrasound; corrosion resistance

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