

# 電解プラズマ酸化処理における 処理液中の金属酸素酸塩の影響

Effects of Metal Oxyacid Salts Contained in Electrolyte  
on Plasma Electrolytic Oxidation

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## Abstract

Plasma electrolytic oxidation (PEO) is a surface treatment technology using anodic oxidation. Recently, PEO coatings have been developed industrially, mainly for application to surface treatment of light metals. This study was conducted to elucidate the effects of metal oxyacid salts such as  $\text{AlO}_2^-$ ,  $\text{SiO}_3^{2-}$  and  $[\text{Zr}(\text{CO}_3)_2(\text{OH})_2]^{2-}$  on PEO coating formation. PEO coatings were formed from pyrophosphate electrolytes respectively containing metal oxyacid salts. PEO coatings showed high hardness as well as metal oxides sintered by molting and cooling. Each metal oxyacid salt was included in the coating, but surface morphology characteristics such as discharge channels and cracks mutually differed. Both the formation rate and contents of the metal oxyacid salts in the PEO coating increased in the following order:  $\text{AlO}_2^- < [\text{Zr}(\text{CO}_3)_2(\text{OH})_2]^{2-} < \text{SiO}_3^{2-}$ . Results show that addition of the metal oxyacid salts enhanced the PEO coating formation rate and uniformity. Presumably, this effect resulted from stability of the metal oxyacid salts in the electrolytes.

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