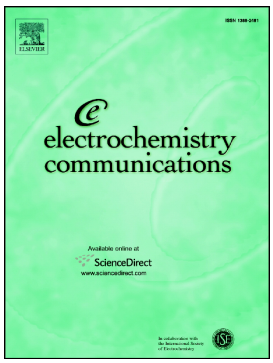

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Studies of oxide growth location on anodization of Al and Ti provide evidence against the field-assisted dissolution and field-assisted ejection theories

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Abstract

Electrochemical anodization, a method of obtaining highly-ordered porous oxides of various metal and alloys, has been studied for decades to elucidate the complicated formation mechanism. Both the widely supported field-assisted dissolution theory and the subsequently proposed field-assisted ejection theory suggest that porous oxide forms at the metal/oxide interface and is dissolved at the oxide/electrolyte interface. Here, in order to test this assertion, three-layered oxide films were fabricated on both Al and Ti foils. Both the inner and outer hemispherical bottoms vanish after the second anodization as they are covered by a new growth of oxide. The disappearance of both inner and outer hemispherical bottoms is evidence against the field-assisted dissolution and field-assisted ejection view that oxide grows only at the metal/oxide