

Metal modification by pulsed discharge in an electrolyte

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A high-voltage (>1000 V) pulsed discharge method was applied for modification of the aluminum and titanium surface in electrolytes containing sodium pentaborate and phosphoric acid in the case of Al and Ti, respectively. The pulsed modification of the metal surface was revealed to be accompanied by a light flash at the electrode. SEM, EDX, XPS and IRRAS were used to study the metal surface before and after modification. The following changes were observed as a result of the pulsed modification: chemical and electrochemical oxidation of the metal surface, boron and phosphorus incorporation inside modified layer, and significant change of the surface morphology.