



*Proceedings of Iran International Aluminium Conference (IIAC2018)  
April 24-25, 2018, Tehran, I.R. Iran*

## **Formation of $\text{TiAl}_3$ coating on titanium sheet to improve the titanium oxidation resistance**

Razieh Khoshhal\*

Department of Material Science and Engineering, Birjand University of Technology, Birjand, P.O. Box  
97175/569, Iran

**Abstract:** In this research,  $\text{TiAl}_3$  layers with different thicknesses were deposited on a titanium sheet by immersion of titanium in molten aluminum for different times. The oxidation behavior of the coated titanium at  $850^\circ\text{C}$  was investigated and the comparison of the results was made with the oxidation behavior of the uncoated titanium sheet. The results showed that the produced  $\text{TiAl}_3$  layer could protect the titanium substrate against the oxidation if it contains an appropriate quality, otherwise not only it cannot withstand the oxidation, but also it accelerates the oxidation process of the titanium substrate. The protection mechanisms of the layers were probed into, performing the XRD analysis. It was found that the  $\text{TiAl}_3$  layer morphology affects oxidation mechanism and oxidation products.

**Keywords:**  $\text{TiAl}_3$ ; Oxidation; Mechanism; Thermodynamic; Immersion,