

The Features of the Polydimethylsiloxane Layers Generated on Aluminium Substrates in Corona Discharge

A. Groza, A.Surmeian, C. Diplasu, C.Luculescu., M.Ganciu
*National Institute for Laser, Plasma and Radiation Physics, P.O.Box MG 36, R-76900,
Bucharest, Romania*

In a polydimethylsiloxane (PDMS) layer generated on aluminium substrate (Al) in corona discharge in air at atmospheric pressure [1], the silicon oxides type and distribution within the layer has been investigated by depth profiling infrared (IR) spectral studies combined with the peak fitting analysis. The dependence of silicon oxides density on the corona discharge current intensity, evidence the presence of an anodization concurrent process of Al substrate at polymer/substrate interface. It will be shown that while the $\text{SiO}_{0.5}$, $\text{SiO}_{1.5}$ suboxide structures are uniformly distributed in the polymer layer bulk, the SiO_4 tetrahedra structures are more present at the polymer surface.

The SEM investigations of the Al substrate after the removal of the PDMS layer from its surface, revealed a porous columnar structure specific to an anodized Al layer. The results are in good agreement with the depth profile IR analysis of the PDMS layer.

Acknowledgements: This work is supported by UEFISCDI Grants, project: PT-PCCA-2011-3.1-1136, of the Romanian Governmental Agency of Scientific Research

[1] A. Groza, A. Surmeian, C. Diplasu, C. Luculescu, P. Chapon, A. Tempez, M. Ganciu, *Surface & Coatings Technology*, 212, 145–151, (2012)