Research of Chemical Pre-treatment Created by Sol-gel Process on the Polished Surface of Aluminium Substrate

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This paper reports the preparation and characterization of thin transparent nanolayers with phase composition ZrF_4 and different modification of SiO_2 with special focus on the affecting the surface roughness of the material and the way of exclusion of the thin nanolayer on the surface of the polished aluminium material. The thin nanolayer was prepared by the sol-gel method. The final treatment based on PTFE was applied on the surface of some samples. This treatment is suitable for the increasing of the wear resistance. The films were characterized with help of SEM microscopy and EDS analysis. The surface roughness was measured with classical surface roughness tester. There was published results on this theme but not on the polished surface of the aluminium material. The results from the experiment shows on the problems with application of these nanolayers because there were found a cracks on the surface of the material and deformations of the layer after application of two nanoproduts and PTFE final layer. The surface layer formation is discussed.

Keywords: sol-gel technology, nanolayers, aluminium alloys, surface roughness, SEM

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