

Analysis of hydrolysis process of g-methacryloxypropyltrimethoxysilane and its influence on the formation of silane coatings on 6063 aluminum alloy

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Abstract-

In this paper the hydrolysis process of γ -methacryloxypropyltrimethoxysilane (MPS) at 1% in an aqueous solution by means of Fourier transform infrared (FTIR) spectroscopy was studied. The aim of this work is to determine the hydrolysis time for which a greater number of Si-OH groups has been obtained. Different hydrolysis times at pH 4 were studied to establish the most optimal application conditions for bonding to the substrate. It was possible to observe how the bands corresponding to the Si-O-C groups present in the pure silane spectrum continued to appear after short periods of hydrolysis. However these bands practically disappeared upon increasing of this hydrolysis time, with other new ones appearing corresponding to the Si-OH vibration. The silanization of 6063 aluminum alloy samples was also carried out. Analysis of the silane layers by means of FTIR indicated that the immersion time may be important according to the hydrolysis conditions, and it also allowed optimizing the drying time.

Index Terms- γ -Methacryloxypropyltrimethoxysilane (MPS); Hydrolysis; FTIR; Aluminum

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