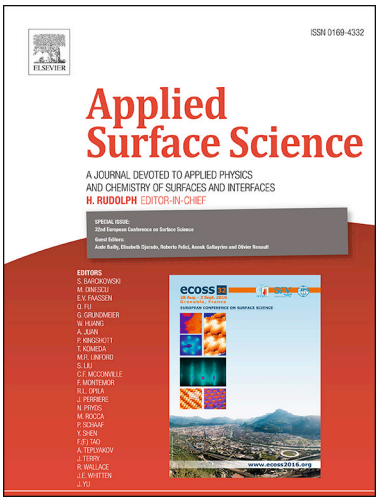

Full Length Article

Investigation on adhesion strength and corrosion resistance of Ti-Zr aminotrimethylene phosphonic acid composite conversion coating on 7A52 aluminum alloy

Qi Liu, Xiaoming Cao, An Du, Ruina Ma, Xiaoran Zhang, Tingting Shi, Yongzhe Fan, Xue Zhao

PII: S0169-4332(18)31935-4
DOI: https://doi.org/10.1016/j.apsusc.2018.07.044
Reference: APSUSC 39859

To appear in: *Applied Surface Science*

Received Date: 11 April 2018
Revised Date: 6 June 2018
Accepted Date: 6 July 2018

Please cite this article as: Q. Liu, X. Cao, A. Du, R. Ma, X. Zhang, T. Shi, Y. Fan, X. Zhao, Investigation on adhesion strength and corrosion resistance of Ti-Zr aminotrimethylene phosphonic acid composite conversion coating on 7A52 aluminum alloy, *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.07.044

Investigation on adhesion strength and corrosion resistance of Ti-Zr aminotrimethylene phosphonic acid composite conversion coating on 7A52 aluminum alloy

Qi Liu, Xiaoming Cao, An Du, Ruina Ma, Xiaoran Zhang, Tingting Shi, Yongzhe Fan*, Xue Zhao*

School of Materials Science and Engineering, Hebei University of Technology,

Key Lab for New Type of Functional Materials in Hebei Province,

Tianjin Key Lab Materials Laminating Fabrication and Interface,

Tianjin 300132, People's Republic of China

*Corresponding author:

Yongzhe Fan: Tel: +86 22 60204527; E-mail: fyz@hebut.edu.cn

Xue Zhao: Tel: +86 22 60204527; E-mail: zhaoxue@hebut.edu.cn

Abstract: In this paper, a chromate free conversion coating based on titanium/zirconium salts and aminotrimethylene phosphonic acid (ATMP) was prepared on 7A52 aluminum alloy. The morphology and composition of conversion coating were investigated by test measurements of SEM、EDS、XRD and FT-IR. The adhesion strength between aluminum matrix and subsequent epoxy primer was tested directly. The roughness and wettability of conversion coating were also detected to indirectly characterize the adhesion strength from another side. The electrochemical tests and neutral salt spray tests were also conducted to measure the corrosion resistance of the prepared conversion coating. Results reveal that a uniform and dense