Corrosion resistance of Cr-Ni-Mo Stainless Steel in Chloride and Fluoride Containing Environment

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Austenitic stainless steels are widely used for various biomedical applications because of their biocompatibility, high resistance to uniform corrosion and suitable mechanical properties. However, they are prone to local corrosion in aggressive halides environments. This article focuses on the effect of fluoride added to physiological saline solution (0.05 % NaF resp. 0.5 % NaF + 0.9 % NaCl solution) and on the effect of fluoride containing mouthwash (0.05 % NaF) on corrosion resistance of AISI 316L surgical steel. Evaluation is based on results of 42-days exposition immersion tests performed at the temperature of 37 °C (REM observation of attacked surfaces, mass losses of specimens) and on the results of the electrochemical cyclic potentiodynamic polarisation tests performed in the same solutions at the same temperature.

Keywords: Austenitic stainless steel, Pitting corrosion, Fluoride, Immersion test, Cyclic potentiodynamic test

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