Development of Models for Prediction of Corrosion and Pitting Potential on AISI 304 Stainless Steel in Different Environmental Conditions

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Stainless steels are found in various aerated aqueous electrolytes in a passive state which protects them from corrosion. In many aggressive solutions, stainless steels are easily depassivated, which can lead to different types of corrosion. This paper tested the impact of chloride ions at different concentration, temperatures and pH values on the corrosion and pitting potential of AISI 304 stainless steel. In order to predict the behaviour of AISI 304 stainless steel design of experiment and artificial neural network methods were applied. Results of the developed models showed good agreement with the experimental results and no significant differences between models.

Keywords: pitting corrosion; artificial neural network; surface response methodology; measurement uncertainty.

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