Electrochemical Noise of Different Steel Alloys under Passivation, Pitting Corrosion and Generalyzed Corrosion Conditions.

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Electrochemical Noise Records for Carbon Steel, Stainless Steel and Duplex Steel were determined under different corrosion conditions: passivity, generalized corrosion and pitting corrosion, using three types of electrolytes, respectively: 1M sodium hydroxide, 1M sodium chloride and 50

Statistical and spectral (Fourier) analysis were performed to determine Noise Resistance and Power Spectral Density for both current and voltage records. Furthermore, polarization resistance technique and Tafel Slope were used to determine type of corrosion and corrosion rate for the three metals and the three electrolytes.

Results show that Noise Resistance is significantly more adequate to evaluate the corrosion type. By mean of this parameter is easy to establish the type of corrosion. Nevertheless, the magnitude of Noise Resistance is independent of the metal, that is, the order of magnitude is determined by the type of corrosion.

It is demonstrated that the spectral analysis is shown as a poor tool for the evaluation of electrochemical noise records because of the slope of the power spectral density can not be used to distinguish between the corrosion rate or the type of corrosion.