

# Correlation Between the Pitting Potential Evolution and $\gamma'$ Phase Precipitation Kinetics in the 2205 Duplex Stainless Steel

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**Abstract:** The aim of this work is to correlate the pitting potential ( $E_{pit}$ ) evolution with the kinetics of  $\gamma'$  phase precipitation in the 2205 duplex stainless steel aged at 850°C after solution treatment at 1150°C. The potentiodynamic polarization curves indicate a reduction of the pitting corrosion resistance with the aging time, which is revealed by a decrease in the  $E_{pit}$  values from 0.65 to 0.40 VSCE. Thus,  $E_{pit}$  values are used to determine the kinetics parameters of the  $\gamma'$  phase precipitation. The experimental transformed fraction agrees well with the one calculated by using the modified Kolmogorov–Johnson–Mehl–Avrami equation with an impingement parameter  $n = 0.6$ .

**Keywords :** kinetic, KJMA, Pitting corrosion, potentiodynamic polarization,  $\gamma'$  phase precipitation