Journal of Materials Engineering and Performance

Volume 27, Issue 8, 2018, Pages 3911-3919

Correlation Between the Pitting Potential Evolution and ?? Phase Precipitation Kinetics in the 2205 Duplex Stainless Steel

Mustapha DJAMA, Djaffar Saidi, Abdelaziz Kadri, Nabil KHERROUBA, Brahim MEHDI, Stéphane Mathieu, Thierry Schweitzer, IDIR Brahim

Abstract: The aim of this work is to correlate the pitting potential (Epit) evolution with the kinetics ofrphaseprecipitation in the 2205 duplex stainless steel aged at 850°C after solution treatment at 1150°C. Thepotentiodynamic polarization curves indicate a reduction of the pitting corrosion resistance with the agingtime, which is revealed by a decrease in theEpitvalues from 0.65 to 0.40 VSCE. Thus,Epitvalues are used todetermine the kinetics parameters of therphase precipitation. The experimental transformed fractionagrees well with the one calculated by using the modified Kolmogorov–Johnson–Mehl–Avrami equationwith an impingement parameterc= 0.6.

Keywords : kinetic, KJMA, Pitting corrosion, otentiodynamic polarization, r phase precipitation