



البحث الخامس

Effect of Sulfide Pollution on the Corrosion Behavior of some Ni-Based Alloys in 3.5% NaCl Solution.

Abstract:

In this work we are interested to investigate the influence of the presence of Cr, Mo and Fe alloying additions with Ni and to investigate the corrosion resistance of these alloys in chloride and chloride-sulfide containing solutions. The corrosion behavior and the stability of Ni-20Cr, Ni-20Cr-9Mo and Ni-20Cr-9Mo-8Fe alloys in 3.5% NaCl and 3.5% NaCl + S- solutions was investigated. Polarization measurements and electrochemical impedance spectroscopy (EIS) were used. Surface examination and morphological studies were employed. Cr, Mo and Fe contents play a significant role against pitting corrosion in chloride and chloride-sulfide environments. Very small current densities were obtained for all investigated alloys in 3.5% NaCl solution compared with that obtained in chloride-sulfide environments. The alloy surface was covered by a barrier layer protecting it from corrosion especially in case of Mo-containing alloy. EIS showed that the resistance of the passive layer created on the different Ni-alloys increases with the increase of the immersion time. EIS measurements revealed that the role of alloyed molybdenum becomes greater in the presence of sulfide. The role of alloyed Cr, Mo and Fe on the corrosion process and the barrier layer creation was discussed. The outcomes lead to the commendation of the Ni-20Cr-9Mo-8Fe alloy for uses in sulfide polluted environments.

Publishing Date :11/5/2021