

## Corrosion Behaviour of Sintered Austenitic Stainless Steel Oxinitrided in Salt Bath

M. Teimouri, N. Pirayesh, H. Khorsand, M. Mousavi Khoie\*, M. Ahmadi\*\*

Department of Mechanical Engineering, K.N. Toosi University of Technology, P.O. Box 16765-3381, Tehran, Iran

\*Department of Mining, Metallurgy & Petroleum Eng., Amirkabir University of Technology, Tehran, Iran

\*\*Department of Metallurgy & Material Eng., Faculty of Eng., University of Tehran, Tehran, Iran

### Abstract

Corrosion rates of austenitic stainless steel prepared by powder metallurgy before and after oxinitriding process has been studied by open circuit potential (OCP) and polarisation methods at room temperature. Polarisation tests at various times after oxinitriding were carried out to reveal the oxidized layer change with time due to the presence of  $S^{2-}$  ion in nitriding bath. Based on corrosion results, at the range of 10-20 ppm  $S^{2-}$ , corrosion resistance was extremely increased. It was also shown that corrosion resistance was improved by two stage oxidation treatment

## Investigation of Oxinitrocarburizing Process on P/M Low Alloy Steel in the Liquid Salt Baths

N. Pirayesh, M. Teimouri, H. Khorsand

Department of Mechanical Engineering, K.N. Toosi University of Technology, P.O. Box 16765-3381, Tehran, Iran

### Abstract

Nitriding is one of the surface treatment methods that is using for improving the tribological behavior of materials. Considering to increasing the application of powder metallurgy steels in several industries and regarding to the essential of surface protection of them, it has been studied the influence of new Oxinitrocarburizing process on the P/M low alloy steel through liquid cyanate salt baths in this research. The existence of  $Fe_3O_4$ ,  $\gamma'$  ( $Fe_4N$ ) and  $\epsilon$  ( $Fe_{2-3}N$ ) phases was indicated by XRD analysis. also it was investigated the microstructure and hardness of layers by SEM and microhardness testing methods. Non-uniformly diffusional zones were indicated due to the increasing of the porosity of P/M steel.