
Development of a user friendly anticorrosive electroplating process

Piumiy Y. Liyanage and Migelhewa N. Kaumal*

Department of Chemistry, University of Colombo, Colombo 03, Sri Lanka

This abstract introduces a user friendly electroplating method that can be performed without special skills or advanced instruments, which will prevent further corrosion of steel surfaces due to small scale damages. The technique used here is based on electrodeposition of a Zn-Ni alloy coating on the damaged site. In this proposed method, an electroplating paste was developed to coat steel surface using the iron migration concept of gel electrophoresis. Initially, the Zn-Ni plating was performed on steel strips using a solution containing Zn and Ni ions. This mixture was acidified and a simple DC power source was used for the electroplating process. The applied voltage was set at 0.9 V, and the Ni^{2+}/Zn^{2+} concentration ratio was set at 1.0 to improve the efficiency of the electroplating process. Tapes containing polyacrylamide gel (diaper pieces) were soaked in the electrolyte solution to obtain the electroplating paste. Steel strips were electroplated with these anticorrosive electroplating tapes by polarizing the surface with a DC power source. The coated steel strips were tested using weight loss and polarizing methods to determine the rate of corrosion and the corrosion potential. Corrosion rate of uncoated and coated steel strips were compared to determine the effect of Zn-Ni plating. Corrosion rate of the steel strips coated using the described method was significantly lower than that of uncoated strips.

Key words: Zn-Ni electroplating, user friendly anticorrosive process

*mnkaumal@sci.cmb.ac.lk