

Effect of temperature on corrosion inhibition of iron base metallic glass alloy in neutral solutions.

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Manuscript received 13 September 2005; accepted 31 October 2005

Abstract

Electrochemical measurements have been used to study the influence of temperature on corrosion and inhibitive effects of 4-methylacetophenone thiosemicarbazone and 4-methoxy acetophenone thiosemicarbazone on the corrosion of Fe78B13Si9 metallic glass in 0.2 M Na2SO4 between 293 and 333K. A good agreement between the data obtained by polarization and impedance measurements was found. Arise in temperature associated with an increase in i_{corr} and $1/R_{ct}$ values and decrease in the inhibition efficiency suggest a physical adsorption model for the corrosion processes. The results show that these compounds almost inhibit the iron-based glassy alloy corrosion at elevated temperatures. The difference in the inhibition behavior of the two compounds is explained in terms of the difference in the electron densities on the centers of adsorption in the thiosemicarbazone molecules. Thermodynamic parameters, ΔE_{app} , ΔH^ and ΔS^* , have been calculated and are discussed.*

Keywords: *Metallic glass; Iron-base glassy alloy; Corrosion; Acetophenone thiosemicarbazone; Physisorption*