

ARTICHOKE EXTRACT AS CORROSION INHIBITOR FOR CARBON STEEL IN ACID MEDIA

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Abstract

The aim of this investigation is to examine the inhibitory effect of artichoke extract toward the corrosion of carbon steel corrosion in 0.5 M sulfuric acid solution. Potentiodynamic polarization and chronoamperometry techniques were used in this work to evaluate the inhibition efficiency of the proposed inhibitor in acid solution. Also, Tafel method for the kinetic parameters determination.

Introduction

The use of different types of inhibitors for the control of metals and alloys corrosion process in aggressive environment is the most common method in practice. Many organic compounds were studied to investigate their corrosion inhibition potential. Many organic compounds have been studied to investigate their possibility of use as corrosion inhibitors. Among the organic compounds studied, those that have N, S and O atoms in their structure, have a high efficiency in the inhibiting of corrosion process. The major disadvantages of these compounds are represented by the high price and increased toxicity for living beings. Experimental studies are currently focusing on finding cheap and safe corrosion inhibitors. Currently, several types of plant extracts have become a possible ecological source, readily available and renewable for a wide range of inhibitors. These extracts are rich sources of ingredients - organic compounds - that have a high inhibitory efficiency. In the future, plant extracts are expected to have the real potential to replace, at least partially, synthetic organic and inorganic inhibitors. The mechanism of action of these types of inhibitors, often referred to as green inhibitors, depends on the structure of the active ingredient.

Carbon steel is currently the most common steel used in the industry, as its price is relatively low, while providing acceptable material properties for many applications. However, the permanent challenge is that of low corrosion resistance of this steel, especially in acidic environments. Industrial processes such as acid cleaning, pickling and descaling in the oil and natural gas exploration industries use acid solutions on a large scale and metallic surfaces used in these environments, made of carbon steel are frequently prone to corrosive attack.

References

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