Effect of natural inhibitors on microalloyed steel corrosion in E5 and E10 biofuels

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In this study, two natural extracts were evaluated as corrosion inhibitors, O. Vulgare and M. Spicata, in sugar cane ethanol mixed with gasoline (E5 and E10 biofuels), which were in contact with X-70 microalloyed steel with different heat treatments. The electrochemical techniques used were potentiodynamic polarization and electrochemical impedance spectroscopy, and I_{corr} was used as an indicator of the corrosion level. The results indicated that the main corrosion mechanism under all conditions is continuous anodic dissolution, which results from concentration polarization. Also, it was found that the microstructure of steel plays a determining role in the inhibition mechanism, which is influenced by energetic reactions related to the Temkin isotherm and physisorption.

Keywords: Natural inhibitors, Biofuels, X-70 microalloyed steel, Corrosion resistance.

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