

Presentation title: Cupressus arizonica fruit essential oil: A novel green inhibitor for acid corrosion of carbon steel

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Abstract :

Natural-based corrosion inhibitors have gained great research interest thanks to their low cost and higher performance. The Cupressus arizonica fruit essential oil (CAFEO) has a higher extraction yield than leaves; however, it has less antibacterial and antifungal activities. The three main components in the CAFEO were α -pinene (51.07%), myrcene (17.92%), and limonene (9.66%). Essential oils with a higher percentage of α -pinene were found to have outstanding corrosion inhibition properties. Therefore, herein, the CAFEO was investigated as a green corrosion inhibitor for carbon steel (CS) in 1.0 mol/L HCl using electrochemical, i.e., potentiodynamic polarization (PDP) and electrochemical impedance spectroscopy (EIS), and scanning electron microscope (SEM) techniques. The experimental results revealed that CAFEO successfully inhibited the carbon steel corrosion in 1.0 mol/L HCl solution. Results from PDP indicated that the inhibitor had a mixed-type effect with a predominance cathodic character. EIS data showed that the charge transfer resistance of the CS electrode increased from 20.9 Ω cm² in blank solution to 294.5 Ω cm² in HCl solution inhibited with 0.5 g/L of CAFEO at 298K, leading to a significant decrease in the double layer capacitance values and an inhibition efficiency ($\eta\%$) of 93%. The high temperatures showed a negative effect on the corrosion inhibition efficiency of the tested inhibitor. At 323K, the $\eta\%$ of CAFEO decreased to 77%. Besides, SEM images showed that the inhibitor formed a protective barrier against acid attack, preventing carbon steel from corrosion.

Biography :

CHERRAD Sara Phd in the field of Biotechnology and environment from the Faculty of Sciences University Ibn Tofail, Kenitra/Morocco, My research focuses on the study of Moroccan medicinal plants, its chemical composition and their pharmacological properties. Also, interested in the ethnopharmacological investigations of Moroccan flora.

