Raman Spectroscopy and Electrochemical Analysis of the Corrosion Behaviour of Reinforcing Steel in the Presence of TEE as an Inhibitor

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doi: 10.20964/2017.09.52

Received: 19 May 2017 / Accepted: 14 July 2017 / Published: 13 August 2017

Using techniques such as in situ and ex situ Raman spectroscopy, cyclic voltammetry (CV), open-circuit potential (OCP) and electrochemical impedance spectroscopy (EIS), this work explored steel corrosion and its inhibition by *Tagetes erecta* (Marigold flower) in 3.5% NaCl solutions. As indicated by the electrochemical analysis, a reduced corrosion rate and corrosion current density as well as more positive corrosion potential values were obtained by adding and increasing the concentration of the *Tagetes erecta* extract (TEE). When the immersion time of an iron electrode in the test electrolyte was lengthened to 24 h, the abovementioned effect was strengthened. Using the Raman method, it was verified that iron corrosion was significantly inhibited by the obstruction of the iron active sites via the adsorption of TEE extract onto its surface when present in the chloride solution.

Keywords: Steel; Inhibitor; Electrochemical analysis; Raman spectroscopy; Corrosion

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