

Synergistic effect of potassium iodide in controlling the corrosion of steel in acid medium by *Mentha pulegium* extract

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Abstract The effect of the mixture of various concentrations of KI and *Mentha pulegium* extract on the corrosion of steel in 1M HCl has been investigated using weight loss methods. The study revealed that steel is more efficiently inhibited by *M. pulegium* in the presence of KI than a pure extract of *M. pulegium*. The inhibition efficiencies increased with an increased concentration of the additives. The highest inhibition efficiency of 84.34 % was observed with single *M. pulegium* extract at 33 %. An improved inhibition efficiency of 90.59 % was observed with the mixture of 33 % *M. pulegium* extract and 3 mM KI at 298 K in 1M HCl. Inhibition efficiency increased with temperature from 308–338 K. The adsorption of inhibitor molecules on the metal surface followed Temkin isotherm.

Keywords *Mentha pulegium* · Green inhibitor · Synergetic effect · Adsorption · Steel

Introduction

The corrosion inhibition of steel is of such interest because it is widely used as a constructional material in many industries and this is due to its excellent mechanical properties and low cost [1].

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