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SYNTHESIS AND CORROSION INHIBITION STUDY OF BENZODIAZEPINES ON MILD STEEL IN SULPHURIC ACID MEDIUM

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2, 4-diphenyl-2, 3-dihydro-1H-1, 5-benzodiazepine (DPBD) and 4- phenyl-2-(2-ethoxy-3-hydroxyphenyl)-2, 3-dihydro-1H-1, 5-benzodiazepine (EPBD) were synthesized by the condensation of o-phenylenediamine and chalcone catalyzed by sulphated zirconia and characterized by FTIR spectra. Corrosion inhibition property of the benzodiazepines on mild steel in sulphuric acid medium was investigated by mass loss and electrochemical methods. The Compound EPBD showed better corrosion protection properties than DPBD both at room temperature and at higher temperatures. The results showed that the compounds act as good inhibitor and the efficiency increased with increase in their concentration. The adsorption of the inhibitors on the surface of mild steel was found to obey Langmuir adsorption isotherm. SEM study showed the formation of a protective adsorptive film of the inhibitor on mild steel surface.

Keywords: mild steel, benzodiazepine, corrosion inhibitors

1. Introduction

Mild steel finds extensive application as structural material in many industries. Acids are used widely in industries for pickling, etching and descaling. When exposed to different acidic environment, mild steel suffers from corrosion resulting in serious metallic loss. The use of inhibitors plays a focal point in corrosion control as it is the most simple and practical method. Majority of the well known inhibitors are organic compounds containing heteroatoms such as N, S, O and multiple bonds which allow the adsorption of the compounds on steel surface [1]. Many N-heterocyclic compounds have been proved to be effective inhibitors in acid medium [2, 3]. Benzodiazepines have

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