

Evaluation of Palm Oil Leaves Extracts as a Potential Environment Friendly Corrosion Inhibitor for Metals



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Abstract Carbon steel were used in various fields as it is economically affordable, environment friendly, highly durable and with high strength. However, carbon steel tends to corrode compared with other superior materials. Corrosion had brought negative effect to economic, health, safety, and also culture. One of the methods use in controlling the internal corrosion is by using the corrosion inhibitor. Inorganic corrosion inhibitor had long been used to suppress corrosion however they are toxic to health and also environment. Therefore, this research had been conducted to evaluate the potential of the corrosion inhibitor from palm oil leaves (POL) extract. The POL extract was extracted using Microwave Assisted Extraction method (MAE). After extraction, POL extract was sent to LC/MSQ-Tof analysis to test for active chemical component present. The presence of active component such as tannin, flavonoid and alkaloid help to inhibit corrosion. Corrosion inhibition testing were conducted by using weight loss method and electrochemical Tafel plot. SEM test show that carbon steel without inhibitor corrodes more than 90% compare with carbon steel coupon contain POL extract as an inhibitor.

Keywords Corrosion inhibitor · Oil palm leaves · Carbon steel · Green inhibitor

1 Introduction

Corrosion is the deterioration of a metal as a result of the chemical reactions between it and the surrounding environment. Among the various methods to avoid or prevent destruction or degradation of metal surface, the corrosion inhibitor is one of the best know methods of corrosion protection [1]. Corrosion inhibitors are chemicals that are added to a chemical stream to prevent corrosion, or lowering the rate of corrosion so that the processing equipment will have a suitable service lifetime [2]. However, there are growing concerns regarding the use of inorganic inhibitors that containing

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387