

Pectin Extract as Eco – Friendly Inhibitor for Mild Steel Corrosion

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Structured Abstract

Background: Corrosion occurs when material is degraded by chemical or electrochemical reactions with its environment, with moisture, temperature, and the presence of certain chemicals being influencing factors. Corrosion can be an issue for a number of reasons, including decreasing the structural integrity of metal things, shortening their lifespan, and causing them to malfunction. This study aims to explore the effectiveness of pectin extract as a corrosion inhibitor in 1 M HCl. Mild steel is utilised as the substrate in the inquiry due to its great mechanical resistance, durability, and toughness.

Methods: The pectin was extracted from mango peels by using acid extraction. The preparation of extracted pectin was in different hours of heating which is 3 hours, 4 hours and 5 hours. Next, the extracted pectin was characterized by using Fourier Transform Infrared (FTIR) and the corrosion measurement was done by weight loss method.

Results: The functional group of pectin was carried out by using FTIR. Carboxylic acid, alkane, ester and anhydride were the major functional group that obtained in pectin. The corrosion rate values obtained show comparable patterns to commercial pectin, confirming the potential of extracted pectin as a corrosion preventive agent. Pectin that has been heated for five hours has a high inhibition efficiency, making it the more optimal sample compared to the other. Pectin that was heated for five hours shown the ability to impede corrosion during immersions lasting up to 24 hours, with a positive inhibition efficiency value of around 35.90% for 1 M HCl. Result also shows that when the concentration is increase, the average weight loss percentage will decrease.

Conclusion: In summary, this study's results showed that pectin extraction from mango peels has a lot of promise for long-term environmental benefits. With the aid of FTIR, the environmentally friendly corrosion inhibitor was identified. Using the weight loss method, the effectiveness of pectin as a corrosion inhibitor in a 1M HCl solution was examined.

Keywords: Pectin, Mango Peels, HCl, Mild Steel

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