

Melamine-Isatin Tris Schiff Base as An Efficient Corrosion Inhibitor for Mild Steel in 0.5 Molar Hydrochloric Acid Solution: Weight loss, Electrochemical and Surface Studies

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Abstract

In the current study, the 3,3',3''-((1,3,5-triazine-2,4,6-triyl)tris(azaneylylidene))tris(indolin-2-one) (MISB) condensation product of melamine (triazine) and isatin is investigated as a mild steel corrosion inhibitor in a 0.5 M HCl. The ability of the synthesized tris-Schiff base to suppress corrosion was evaluated utilizing weight loss measurements and electrochemical techniques. The maximum inhibition efficiency of 92.07 %, 91.51 % and 91.60 % were achieved using 34.20×10^{-8} mM of MISB in weight loss measurements, polarization, and EIS tests, respectively. It was revealed that temperature rise decreased inhibition performance while increasing inhibitor concentration increased it. The analyses demonstrated that the synthesized tris-Schiff base inhibitor followed the Langmuir adsorption isotherm and was an effective mixed-type inhibitor having a low cathodic

predominance. According to the electrochemical impedance measurements, the R_{ct} values increased with the increase of inhibitor concentration. The weight loss and electrochemical assessments was also supported by surface characterization analysis and SEM images shows a substantial smoothness in the surface morphology.

Keywords Corrosion, inhibition, Mild Steel, Electrochemical, Synthesis

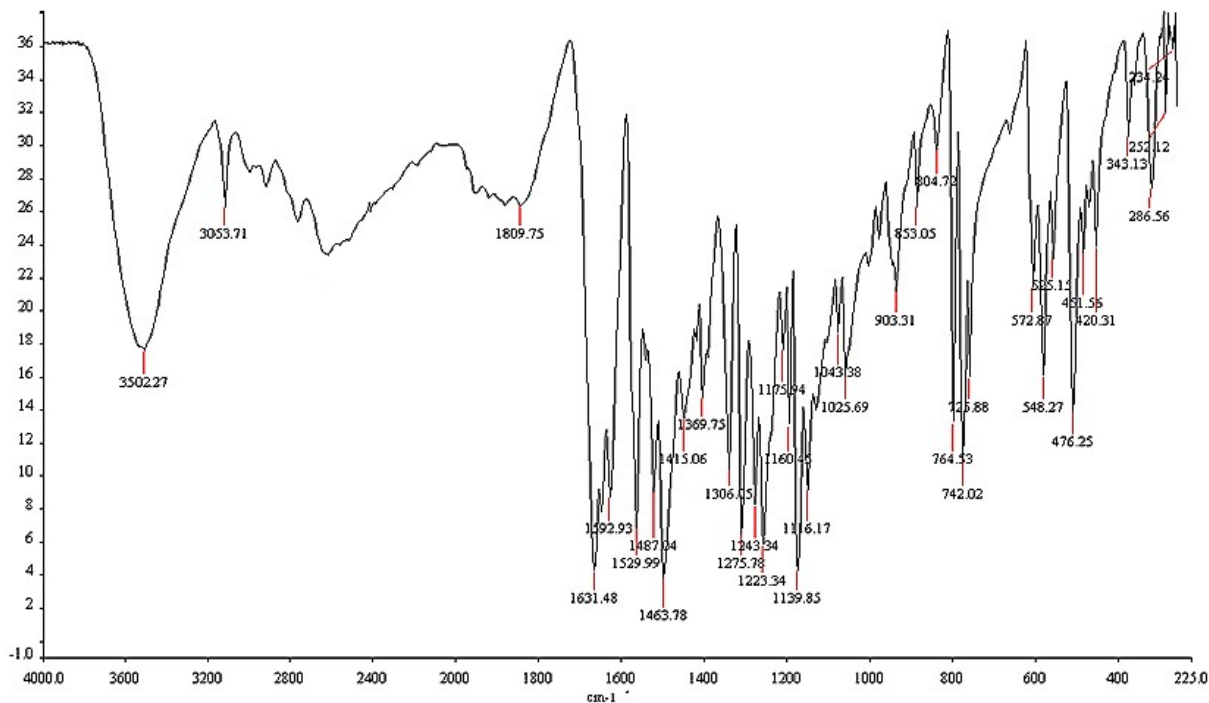


Fig.1 FTIR Spectra of MISB

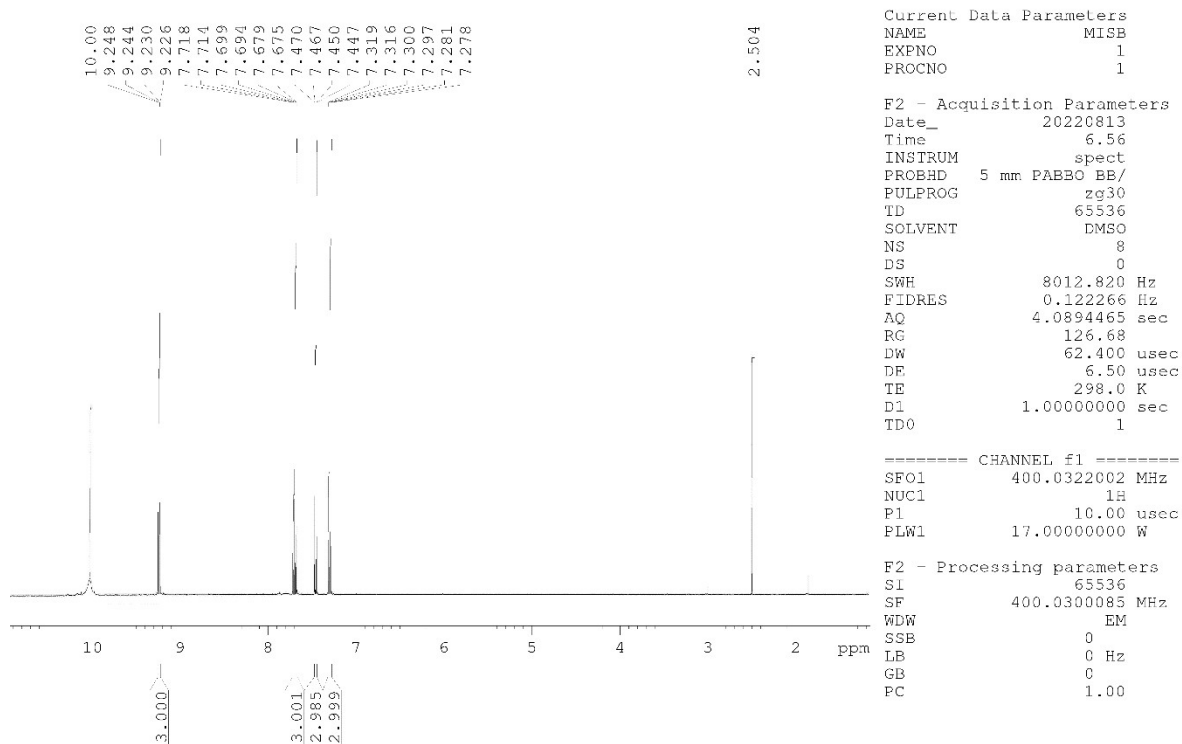


Fig.1 ¹H NMR of BNSB01

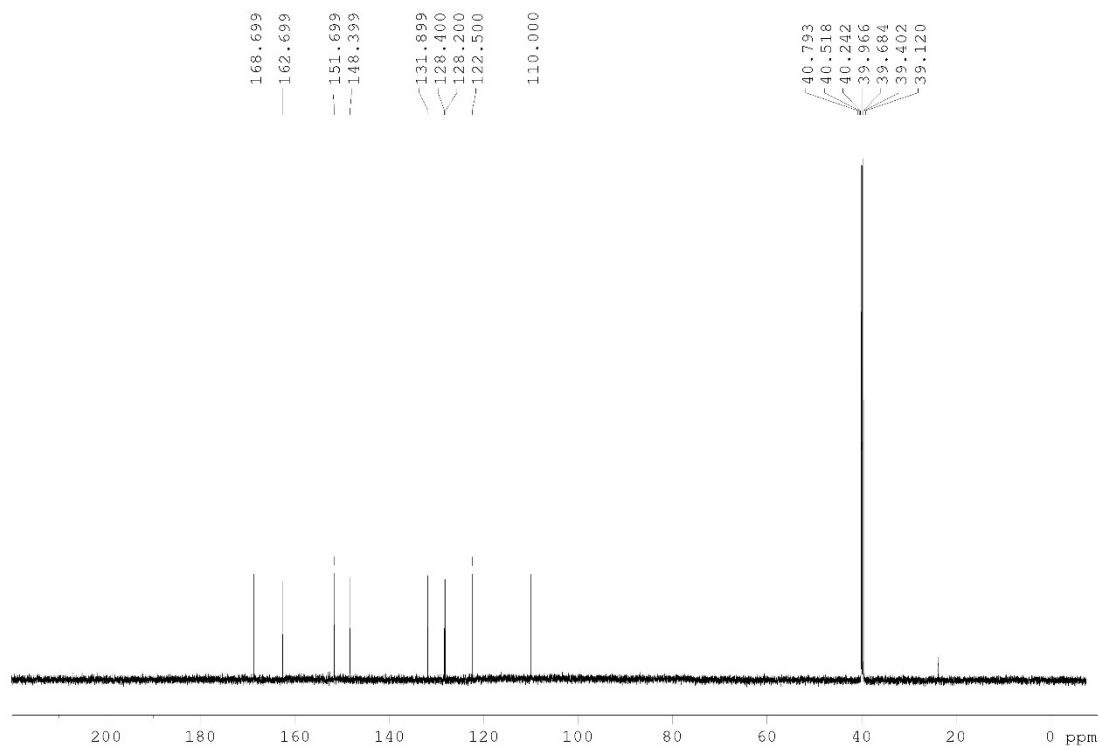


Fig.2 ¹³C NMR of BNSB01

