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### Synergistic Effect of Zinc ion on Corrosion Inhibition of Carbon Steel in aqueous solution using L- Methionine

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**Abstract:**The corrosion and inhibition behaviors of carbon steel in the presence of L-Methionine and ZnSO<sub>4</sub> have been studied using gravimetric method and electrochemical techniques. Results obtained by various techniques are close to each other and maximum Inhibition efficiency is 93%. Synergistic parameters and Statistical study of “F” test suggest that a synergistic effect exists between L-Methionine and Zn<sup>2+</sup>. The protective film on the metal surface has been analyzed by FT – IR spectra. A suitable mechanism of corrosion inhibition is proposed based on the results obtained from weight loss study, electrochemical study and surface analysis technique. The inhibitor L-Methionine – Zn<sup>2+</sup> system may find application in cooling water system.

**Keywords:** Carbon steel, L-Methionine, ZnSO<sub>4</sub>, synergistic effect, F-Test, FT-IR spectra.

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