

INHIBITION EFFECT OF LYSINE FOR LOW ALLOY CARBON STEEL IN ACIDIC MEDIA.

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Abstract

The use of inhibitors is one of the most practical means for protecting metals against corrosion, especially in acidic media. The interest is to use organic compounds as inhibitors due mainly to their inherent and non-toxic nature. Amino acids are attractive as corrosion inhibitors because they are nontoxic, relatively easy to produce with high purity at low cost, and are soluble in aqueous media. Lysine one kind of amino acid is use as inhibitor. The aims of this study are to show corrosion protection efficiency of lysine and to explain the mechanism of corrosion. The experimental results demonstrated that the lysine offered protection for low alloy carbon steel in aggressive environments like H₂SO₄. Materials under investigation are two kind of low alloy carbon steel marked as: Steel 39, Steel 44 (usually applied to concrete as reinforcing bars). The corrosion media consists in sulfuric acid in presence of chloride ions, in form of NaCl (H₂SO₄ 1M +Cl⁻ 10⁻³M). Potentiodynamic polarization methods accompanied with work surface microscope study are used for inhibitor efficiency testing. Potentiodynamic polarization measurements showed that the presence of lysine in acidic solution decreases the corrosion current to a good extent and shifts the corrosion potential towards more positive values. The corrosion inhibition efficiency improves with the increase of the concentration. Use of this inhibitor in concentration 1 g/L, referring the corrosion protection of steel 39 (best case) presents protection efficiency 78.88% and classified as good for this extreme aggressive conditions.

Key words: *lysine, aminoacid, steel bars, tafel polarization.*