

## Lysine as corrosion inhibitor 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 used 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  $H_2SO_4$ . Materials under investigation are two types 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 ( $H_2SO_4$  1M +  $Cl^-$   $10^{-3}$ M). Potentiodynamic polarization methods 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. The corrosion inhibition efficiency improves with the increase of the lysine concentration. The use of this inhibitor (1g/L) protects steel 39 in acidic media with 78.88% efficiency. That means lysine is a good corrosion inhibitor for these aggressive conditions.

*Keywords:* lysine, amino acid, steel bars, Tafel polarization.

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