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Kinetics of corrosion inhibition of aluminum in acidic media by water-soluble natural polymeric chondroitin-4-sulfate as anionic polyelectrolyte inhibitor

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Research Highlights

- Corrosion inhibition has been studied using both gasometric and weight loss techniques.
- Study the influence of various inhibitors for Al corrosion in both acidic and alkaline solutions.
- Geometrical structure of the inhibitor, concentration of the corrosive medium, and the temperature were examined.
- Elucidation of a suitable corrosion mechanism.

ABSTRACT

Corrosion inhibition of aluminum (Al) in hydrochloric acid by anionic polyelectrolyte chondroitin-4-sulfate (CS) polysaccharide has been studied using both gasometrical and weight-loss techniques. The results drawn from these two techniques are comparable and exhibit negligible differences. The inhibition efficiency was found to increase with increasing the inhibitor concentration and decreased with increasing temperature. The inhibition action of CS on Al metal surface was found to obey both of Langmuir and Freundlich isotherms. The factors affecting the corrosion rates such as the concentration and geometrical structure of the inhibitor, concentration of the corrosive medium, and the temperature were examined.

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