

## Corrosion behavior of AISI 316L stainless steel in a NaOH-H<sub>2</sub>O mixture.

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Potentiodynamic polarization analysis and electrochemical impedance spectroscopy, were used to determine the corrosion rate AISI 316L stainless steel (316L) in a NaOH-H<sub>2</sub>O working air-conditioning mixture. The aqueous concentrations were 40% and 50% (w/w), temperature was set at 35°C and 90°C (similar to the conditions of the absorber and generator in an absorption air-conditioning system). The results showed that the material exhibited a passivation region in all cases, and the corrosion mechanism was dominated by charge transfer. Additionally, at 35°C and 90°C the corrosion process was mainly influenced by the concentration and temperature of the solution. The results were attributed to the steel chemical composition, the chemical stability of the corrosion products, the structural state of the passive film, and the ability to prevent the diffusion of metal ions. According to the results, the NaOH-H<sub>2</sub>O mixture possesses electrochemical characteristics that permit its application as a working fluid for air-conditioning absorption processes.

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**Keywords:** Absorption systems, NaOH-H<sub>2</sub>O solutions, Stainless steel AISI 316L, Corrosion resistance.

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