Short Communication

Corrosion Characteristics of Aluminum in Highly Diluted Ammonia Solution

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Aluminum radiators working with deionized water in high voltage direct current (HVDC) transmission systems were severely corroded. In this paper, the corrosion behavior of aluminum from an aluminum radiator in HVDC in highly diluted ammonia solution was studied, focusing to reduce the corrosion of aluminum in nearly neutral aqueous solution. The surface of the aluminum electrode was covered with Al(OH)₃ and/or Al₂O₃, and the corrosion products could reduce further corrosion. It was found that an aluminum electrode in 0.84 μmol L⁻¹ ammonia solution had the lowest corrosion rate, and its mechanisms for good corrosion resistance were given. This technology can be used for material anticorrosion in heat-exchange equipment with cooling water.

Keywords: Aluminum, Corrosion, Ammonia solution, Radiator, Thyristor, HVDC

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