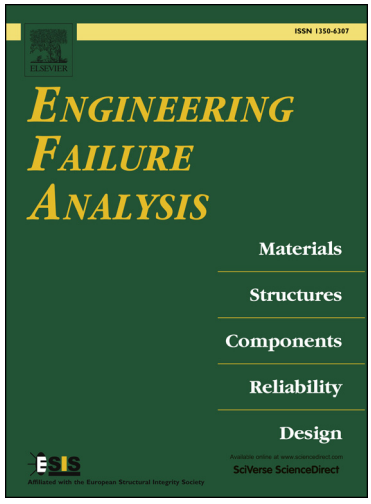

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Corrosion analysis and inhibition studies in the process of natural gas wet desulfurization

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Abstract: The present work investigates the corrosion on Fe-Al alloy steel in the process of the wet desulfurizing of Sichuan natural gas purification master plant. The morphology and composition of the corrosion scale are characterized by scanning electron microscopy, X-ray power diffraction and energy-dispersive spectroscopy. Results show that corrosion scale mainly consists of FeS. Electrochemical methods such as polarization curve and electrochemical impedance spectroscopy were used to analyze the effects of alcohol amine concentration and temperature on the corrosion. It can be found that the strongest corrosion occurs at the temperature of 50℃ and the concentration of 40% alcoholic solution. In addition, the electrochemical experiments demonstrate that the corrosion rate can be apparently reduced by adding corrosion inhibitors such as diethanol amine and triethanolamine.

Keywords: corrosion analysis; inhibition study; wet desulfurization; natural gas