

Study on the Corrosion Behavior of Low Carbon Steel in Oilfield Wastewater Containing CO₂/H₂S

Yuanguang Yue¹, Zhibiao Yin¹, Shiming Li¹, Ziyue Zhang¹, Qifu Zhang¹

¹National Engineering Laboratory of Advanced Coating Technology for Metal Materials, Central Iron & Steel Research Institute, Beijing, China

Presenter's e-mail address: yueyuanguang@126.com

Abstract Oil and gas field surface systems are facing serious corrosion problems of metallic pipelines caused by CO₂ and H₂S. Although the traditional chip method of corrosion monitoring is feasible, it has limitations in terms of accuracy and real-time performance. In this study, the corrosion of 20# steel in a CO₂-H₂S environment was systematically evaluated by simulating oilfield wastewater and experimental groups under different conditions (single CO₂, H₂S, and a mixture of the two) using an innovative electrical resistance probe technique for monitoring corrosion in oilfields. The data analysis reveals the influence mechanism of corrosive medium on the monitoring accuracy of the resistance probe, which provides scientific basis and technical support for improving the performance of the equipment and ensuring the safety monitoring of oil and gas pipelines containing hydrogen sulfide and carbon dioxide.

Keywords Oil and gas field; Pipeline corrosion; CO₂; H₂S; Corrosion monitoring

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