

Microbial Corrosion on Oil and Gas Facilities: A Case Study of Oil and Gas Facilities in the Niger-Delta

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Abstract : Corrosion in the oil and gas industries is one of the most common causes of failure. Such failure includes leaks in above-ground storage tanks (AGST). The involvement of microorganisms in the corrosion process in AGST systems is often ignored, and this outlines the need to investigate the effect of microbial corrosion in oil and gas facilities. This study's methodology comprised gathering generated water samples from a nearby AGST oil facility that was operating, which were then equally divided into two batch reactors, 1 and 2. Each batch reactor was filled with five prepared X60 coupons using sterilized forceps. To provide nutrients for the microorganisms in batch reactor 1 during the test period, 2g of NPK 15- 15-15 fertilizer was added on a weekly basis. To kill the microorganisms and significantly lower their concentration in the generated water, 5ml of dissolved ozone (a biocide) with a 0.5ppm concentration was added to batch reactor 2. The weight loss measurement (WLM) was used to evaluate for corrosion. Coupons were removed from each batch reactor, and weight loss was measured at every interval of 336 hrs for 2016 hrs. The overall results obtained indicated that coupons from the batch 1 reactor showed a higher corrosion rate and higher mass loss, and this was due to the metabolic production of an aggressive compound in the medium.

Keywords : AGST, microbial corrosion, reactor, X60 steel

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