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Title of Paper: Study of SRB adherence on carbon steel surfaces by electrochemical and microscopic techniques

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Abstract: It is well known that microbiologically influenced corrosion (MIC) is a serious issue in the oil and gas industry. This process is caused by a mixture of microorganisms, including aerobic and anaerobic bacteria. Among the later, the Sulfate Reducing Bacteria (SRB) are often designated as the pricipal organisms responsible for MIC in anaerobic environments such as those found in the oil extraction industry. Extracellular polymeric substances (EPS) produced by SRB have the ability to accelerate corrosion by binding with metal ions. The aim of this study was to evaluate the formation of biofilms of SRB on carbon steel surfaces by electrochemical and microscopic techniques. Two types of anaerobic bacterial cultures were used in the experiments: pure cultures of *Desulfovibrio vulgaris* and a mixed culture of SRB obtained from the oil industry. Carbon steel coupons of SAE 1010 were placed in the cultures. At various times, coupons were extracted and bacterial adherence was measured by viable SRB counts, epifluorescence microscopy and by crystal violet assay. The surface attack and biofilm morphology were analyzed by scanning electron microscopy (SEM). The corrosion of the carbon steel surface was monitored using electrochemical techniques, electrochemical impedance spectroscopy and corrosion potential measurements. Studies carried out allowed the correlation of adherence and EPS of the tested SRB strains with the different degree of attack suffered by the SAE 1010 carbon steel coupons.