Effect of Surfactants in Preventing Corrosion of Mild Steel in Acidic Medium

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ABSTRACT

The corrosion inhibition by surfactant molecules is related to the surfactant's ability to aggregate at interfaces and in solution. Surfactants adsorb on surfaces due to their amphiphilic nature and form aggregates with different morphologies, which potentially provide different extent of corrosion inhibition. The mild steel corrosion in acid solution has been effectively controlled by the use of organic substances containing N, O or S in the conjugated system as inhibitors through which they get adsorbed on metal surface. The effect of surfactants on corrosion of mild steel in Sulphuric acid was studied using three techniques namely, Galvanstatic, Potentiostatic and Scanning Electron Microscopic (SEM) studies. The galvanostatic and potentiostatic studies were performed to determine the corrosion current, inhibition efficiency, passivation current and passivation potential range. The parameters so obtained were used to explain the effectiveness of additives when present in different concentrations. SEM studies also help to understand the changes that take place on the surface layer with respect to change in surfactant's concentration. The extent of corrosion inhibition has also been evaluated by comparing the micrographs obtained from SEM. The results obtained are in direct agreement with the electrochemical studies.

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