



LOW-CARBON STEELS CORROSION IN WATER-CONTAMINATED ORGANIC MIXTURES OF ADIPIC ACID AND METHANOL

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Abstract

The corrosion resistance of three types of low-carbon steels in water-contaminated mixtures of adipic acid and methanol was investigated. The concentration of water in the organic mixture was progressively raised from 1% to 5%, while the carbon concentration in the steel samples varied from 2% to 4%. Infrared spectroscopy (IR) and X-ray diffraction (XRD) were used to investigate the insoluble corrosion products. Based on the weight losses measurements, on the polarization curves and on the scanning electron microscopy (SEM) analysis, a corrosion mechanism was assigned for each type of steel. The kinetics parameters of corrosion: E_{cor} (corrosion potential), E_{st} (steady potential) and I_{cor} (corrosion current density) were determined from experimental polarization curves. The highest corrosion resistance was exhibited by the steel sample containing 4% of carbon.

Key words: low-carbon steel, polarization curves, corrosion mechanism, organic mixtures

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