

The Effect of Power Plants' Environmental Factors on the Properties and Corrosion Behavior of Carbon Steel

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Abstract

The purpose of this study is characterization and classification of the atmospheric corrosivity for different cities, located at north, center and south of Iran. These sites were monitored monthly to determine the corrosion rate and degradation that originated from deposition of atmospheric contaminates such as chloride ions (Cl⁻), sulfur-containing substances, represented by SO₂ and dust fall. The corrosion products have been characterized by X-ray diffraction (XRD) and scanning electron microscopy/energy dispersive X-ray spectroscopy (SEM/EDS). The results show that the weight loss values are about 3.560, 1.750, 2.795 and 8.965 g at Gilan, Hamedan, Tehran and bandar-abbas, respectively. In other word, corrosion rate is minimum in Center of Iran, and increases in north and south of Iran respectively. Because of more wetting time, chloride and Sulfur ions contents, the south areas have the most degradation caused by atmospheric corrosion. Also, the microstructure observations confirm the corrosion measurements.

Keywords: Atmospheric corrosion, carbon steel, Power Plants.

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