Short Communication

Corrosion of Weathering Steel under Light Illumination and Simulated Atmospheric Conditions

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Earlier investigations have shown that corrosion products of weathering steel presented photovoltaic effect under illumination. In this study, we explored the influence of chloride ions on this effect and the related corrosion behavior. Open circuit potential, electrochemical impedance spectroscopy and Mott-Schottky plots were recorded on weathering steel surface treated with NaCl after 3 days exposure in simulated atmospheric condition under illumination. For comparison, similar study was also performed on the weathering steel surface without NaCl deposition. There was clearly photoelectrochemical response difference between the samples. It was found that the defects concentration and electric conductivity of the corrosion products were higher due to the chloride ions migration, which was promoted by incorporation of photo-generated holes under illumination. The detailed mechanism was discussed in this study.

Keywords: atmospheric corrosion; chloride ions migration; photovoltaic effect

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