Electrochemical Evaluation of Reinforcement Concrete Exposed to Soil Type SP Contaminated with Sulphates

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The present research evaluates the electrochemical behaviour of concrete exposed to SP soil type, sand from marine environment and contaminated with 1, 2 and 3 % de MgSO_4 , this experimental setup simulates what happens on the foundations of civil infrastructure as bridges, docks, highways, etc., when they are built on contaminated soils with this aggressive agent due to discharges of wastewater, marine waters or areas polluted by agrochemicals. The concrete used in making specimens of study was designed according to the ACI method 211.1, it was considered to design the concrete mixture a ratio $w/c=0.65$ ($f'c=250 \text{ kg/cm}^2$), two types of cement, ordinary portland cement (CPC 30R) and sulphate-resisting cement (CPC 30R RS), in the specimens were embedded as reinforcement bars of steel AISI 1018 and Galvanized steel. E_{corr} was evaluated according to the standard ASTM C-876-09 and the corrosion kinetics I_{corr} it was monitored by the technique of Linear Polarization Resistance (LPR), according to standard ASTM G-59-97(2009). The results of E_{corr} and I_{corr} correspond to 266 days of exposition in specimens to SP soil type contaminated with MgSO_4 indicating with increasing concentration of aggressive agent to 3% it is considerably decreased the corrosion resistance of the concrete specimens produced with sulphate resisting cement and reinforced with galvanized steel.

Keywords: Soil, Concrete, Corrosion Potential, Electrochemical, Sulphates

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