Research on the Influence of Distance Between the Improved Ag/AgCl RE and the steel on the Corrosion Evaluation in Concrete

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In this paper, the impact of the distance between the improved Ag/AgCl RE and the steel in concrete on the corrosion monitoring exposed to the accelerated drying/wetting cycles has been investigated. The 3D morphology of steel surface was obtained by 3D video microscope. Results showed that the corrosion rate of steel determined by MS 1 was more accurate and reliable than those by MS 2 and 3. The C_{red} value measured by MS 1 was clearly lower than that determined by MS 2 and MS 3. However, the C_f value measured through MS 1 was in higher side compared to that by MS 2 and MS 3. Therefore, it was recommended to place the corrosion monitoring system close to the working electrode as soon as possible in order to obtain the precise measurements of corrosion condition of steel. Beside, the half-cell potential (HCP) of steel in concrete with respect to MS 1 are -185, -185 to -297, -297 to -455 and -455 mV for passive, low to moderate corrosion rate, moderate to high corrosion rate and high corrosion rate conditions.

Keywords: Concrete, Steel corrosion, Embedded sensor, Drying/wetting cycle

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