

A simple arrangement and procedure for in-situ measurement of corrosion rate of rebar embedded in concrete

Shamsad Ahmad and B. Bhattacharjee

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Abstract:

An arrangement for the *in-situ* measurement of the corrosion current density, i.e. corrosion rate, of rebar embedded in concrete through a linear polarisation technique is described. It incorporates a simple experimental method being suggested for determination of the ohmic resistance of concrete, which enables the ohmic drop to be eliminated mathematically from the polarisation data. The error due to non-uniform distribution of the applied electric signal through a small size counter electrode to the working electrode (rebar) is removed by using the transmission line model. A calculation procedure for estimating Tafel slopes has also been suggested for precise estimation of the Stern-Geary constant. The utility of the arrangement and the experimental procedure suggested for *in-situ* corrosion rate measurement is demonstrated through a carefully planned experimental scheme.