Peyman Taheri

Post-doc researcher

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Research interests:
Corrosion inhibitors
Surface and interface
Electrochemistry

Surface and Interface

Recent Research activities:

Selection of an inhibitor is usually based on results of laboratory or field tests. Corrosion inhibition mechanisms depend on several parameters ranging from the inhibitor, metal surface and electrolyte properties. Each of these parameters may vary during the corrosion and/or inhibition processes leading to a change of the inhibitor performance. This becomes more complicated when several corrosion inhibitors are screened. Therefore, real-time monitoring of the inhibition efficiency versus the exposure time is demanded for reliable interpretations, while quick data acquisition is required to shorten the inhibitor-screening process. There are several high-throughput screening methods based on electrochemical measurements to assess the corrosion inhibition of a large number of compounds.

Linear polarization resistance (LPR) method involves slight polarization of the sample, typically in the order of ±10mV, relative to its open circuit potential (OCP). As the potential is changed slightly, a current will be induced flowing between the working and counter electrodes. Therefore, the material's resistance to polarization can be extracted from the slope of the potential versus current curve. This resistance can in-turn be correlated to the corrosion rate (i_{corr}) where the greater polarization resistance values refer to a better corrosion inhibition as described by the following formula:

$I_{corr}=B/[\Delta E/\Delta I]_{E\to 0}$

where B is the constant, E the potential and I the current.

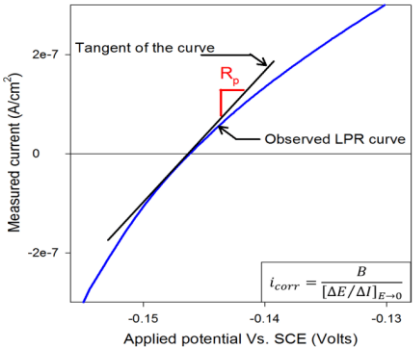

Fig 1. *Extraction of the LPR value from the I-V curve.*

Other activities:

-Managing editor of Elsevier's "Corrosion science".

- Peer review of 18 scientific manuscripts.

Recent key publications:

- P. Taheri, H.M. Fahad, M. Tosun, M. Hettick, D. Kiriya, K. Chen, A. Javey, ACS Applied Materials & Interfaces, 2017, 9, pp. 20648−20655.
- S.A. Haddadi, S.A.A. Ramazani, M. Mahdavian, P. Taheri, J.M.C. Mol, Chemical Engineering Journal, 2018, 352, pp. 909–922.
- S. A. Haddadi, A. Ramazani S. A., M. Mahdavian, P. Taheri, J. M. C. Mol, Industrial & Engineering Chemistry Research, 2019, 58, pp. 3033−3046.