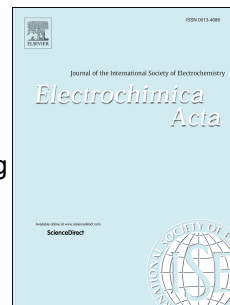


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Local electrochemical impedance spectroscopy in dynamic mode of galvanic coupling

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ABSTRACT

A novel method that combines local electrochemical impedance spectroscopy and mapping in dynamic mode is proposed. Method was validated over two galvanic couplings, namely zinc/copper and cadmium/copper. Impedance spectrum response for all measuring points was obtained by means of simultaneous implementation of selected range of frequencies. Proposed method allows the measurement in a more time-efficient manner, at the same time providing extensive impedance characteristic. Moreover, the aspect of probe-to-sample distance was introduced. Furthermore, the inversion of the probe-to-sample distance experiment direction allows for determination of approaching procedure for local impedance measurements (with support of theoretical calculations). Proposed method was compared with standard LEIS measurement on system which undergoes rapid changes, giving results that were not obtainable with standard method. This indicates that by applying dynamic measurements, it is possible to introduce additional variable into the investigated system, what should contribute to broader application of local impedance measurements.

KEYWORDS

Local Electrochemical Impedance Spectroscopy; Local Electrochemical Impedance Mapping; Galvanic Corrosion; Dynamic Electrochemical Impedance Spectroscopy

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