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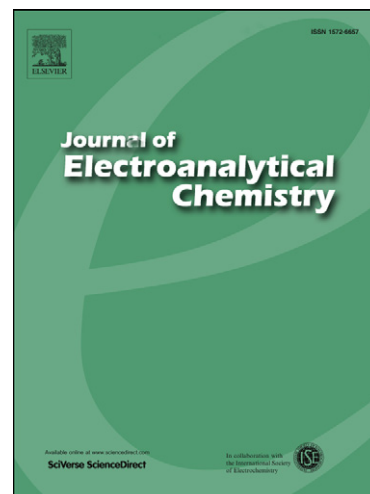
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The interaction of a polycrystalline gold electrode with ethanethiol in alkaline solution

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Keywords:

Electrochemistry, SAM, thiol, XPS, alkaline solution, gold electrode,

Abstract:

The electrochemical behavior of ethanethiol was studied on polycrystalline gold electrodes in alkaline solution. With the help of cyclic voltammetry, differential pulse voltammetry and ex-situ X-ray photoelectron spectroscopy it is possible to propose a coherent reaction mechanism. Under the experimental condition gold thiolate and “gold hydroxide” are formed at the respective potentials. Dissolved and surface confined thiolate can be oxidized to the corresponding dithiol. The “gold hydroxide” reduction is accompanied by gold thiolate formation; the latter being stable at more negative potentials than the gold hydroxide. The experimental results indicate that thiolate ions react with the “gold hydroxide” layer by formation of a gold–thiolate layer and release of hydroxide ions to the solution. This non–electrochemical reaction is confined to the potential range where the gold–thiolate layer is stable.

1. Introduction:

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