Documents

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Sequential in situ STM imaging of electrodissolving copper in different aqueous acid solutions

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Abstract
The dynamics of Cu surfaces immersed in either aqueous HClO4 or H2SO4 solution under galvanostatic conditions at room temperature was studied by in situ scanning tunneling microscopy (STM) sequential imaging. The mobile interface depends considerably on the apparent current density (j) applied to the specimen. At j = 0, the Cu topography turns out to be highly dynamic as mass transport among different domains takes place. Conversely, for j = 6 μA cm-2 an inhomogeneous attack of the Cu surface leading to a remarkable increase in roughness and to the formation of etched pits at certain surface domains can be observed. Etched pit domains drive the mobile interface to an unstable regime. The addition of HCl to those acid solutions to reach concentrations higher than 10-2 M leads to the formation of a Cu2Cl2 layer. © 1997 Elsevier Science Ltd.

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