Documents

Aziz, S.G.[a b] , Vela, M.E.[a] , Andreasen, G.[a] , Salvarezza, R.C.[a] , Hernández-Creus, A.[a c] , Arvia, A.J.[a]

Sequential in situ STM imaging of electrodissolving copper single-crystal domains in aqueous perchloric acid: Kinetics and mechanism of the interface evolution

(1997) *Physical Review B - Condensed Matter and Materials Physics*, 56 (7), pp. 4166-4175. Cited 6 times.

[a] Inst. Invest. Fisicoquimicas T., Sucursal 4, Casilla de Correo 16, 1900 La Plata, Argentina
[b] Department of Chemistry, University of King Abdulaziz, Jeddah, Saudi Arabia
[c] Departamento de Quilmica-Fisica, Universidad de La Laguna, Tenerife, Spain

Abstract
The evolution of Cu crystal surfaces in an aqueous perchloric acid solution at both null (j=0) and constant anodic apparent current density (j=6 μA cm-2) at room temperature was followed by in situ scanning tunneling microscopy sequential imaging. For j=0, the Cu surface turns out to be highly dynamic as terrace growth step displacement, and smoothening of small pits can be observed. These processes lead to a small decrease in the value of the root-mean-square roughness (ξ). On the other hand, for j=6 μA cm-2, an inhomogeneous attack proceeds with a marked increase in ξ. In this case, while some surface domains become progressively rough others develop nm-sized etched pits that turn the interface unstable. The evolution of the Cu topography under the experimental conditions of this work was simulated using a Monte Carlo algorithm based on a dissolution model in which surface processes are influenced by inhomogeneity stabilizing cavities.

Document Type: Article
Source: Scopus