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Electrocatalytic oxidation of CO on Ru (0001) surfaces: The influence of surface disorder

Ru (0001) 표면위에서의 일산화탄소의 전기화학적 산화연구: 표면거칠기의 영향

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Smooth and rough (created by argon ion sputtering) Ru (0001) surfaces were structurally characterized by reflection high energy electron diffraction (RHEED), and their activity in electrooxidation of CO in 0.1 M $HClO_4$ solution was probed by cyclic voltammetry (CV). While the onset potentials for CO oxidation on the smooth surface varied with the adsorbate composition (which was changing in subsequent scans), these were markedly (ca. 0.3 V) lower with the rough surface. This difference is attributed to the varying properties of the Ru–O bond whose activation is considered to be rate-limiting. The enhanced activity of the rough surface is also reflected by the fact that the entire amount of adsorbed CO becomes completely oxidized during the first anodic scan, while with the flat surface at least three cycles are required.