

Symp C1

Initial Adsorption Stage of Irreversibly Adsorbing Sb on Au(111)

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The adsorption process of irreversibly adsorbing Sb on Au(111) at open circuit potential (0.2 V) was investigated with in-situ STM. The adlayer of oxygenated Sb nucleated and grew on terraces and at step edges. The oxygenated Sb domains on terraces were round-shaped islands, whose size ranged from 3 nm to 6 nm in diameter. The adlayers originated from step edges, on the other hand, grew perpendicularly to the steps to show terrace-like uniform domains. There was no island of Sb on such terrace-like oxygenated domains. In the long run, the island-shaped domains and the terrace-shaped domains were inter-connected to produce a networked monolayer of oxygenated Sb. The network adlayer of oxygenated Sb was modified to a simple layer of nanoislands of elemental Sb, when the electrode potential was held at 0.25 V. Upon a subsequent re-oxidation, the Sb-covered Au(111) surface took a complex morphology filled with lots of pits and relatively wide islands. Also, atomic images of the Sb layers on Au(111) at various potentials were presented as well.

Key words: Au(111), Sb, Irreversible adsorption, STM, in-situ