

ST-P011

Self-Assembled Structures of Glutaric Acid on Cu(110)

박은희, 민영환, 김세훈

Molecular-Level Interface Research Center, Department of Chemistry, KAIST

We have investigated the self-assembled structures of glutaric acid ($\text{HOOC}-(\text{CH}_2)_3\text{-COOH}$) on the Cu(110) surface as a function of coverage using Scanning Tunneling Microscopy (STM). At low coverage, glutaric acid molecules diffuse freely on Cu(110) surface at room temperature, thus they can't form ordered structures at this coverage. However, when we scanned the same area several times, novel structures have been created during scanning due to the field-induced self-assembly. Also, the induced structures are quite stable during continuous scanning process. At 0.25 ML, glutaric acid adsorbs as a bi-glutarate ($-\text{OOC}(\text{CH}_2)_3\text{-COO}-$) after annealing to 450 K producing a racemic conglomerate of coexisting mirror domains. Although the molecule is achiral, it forms chiral domains on the surface from adsorption-induced asymmetrization. At 0.5 ML coverage, zigzag structure is observed, and still glutaric acid adsorbs as a bidentate configuration. This bi-glutarate structure is stable until 650. Finally, at 1ML, glutaric acid adsorbs as a mono-glutarate at room temperature forming close packed structures.

Keywords: Glutaric acid, Cu(110), Self-assembled structures