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High resolution scanning photoelectron microscopy study of l-cysteine and s-benzyl-l-cysteine on platinum: Adhesion mechanisms and radiation damage

Room temperature in-situ deposition of L-cysteine and S-benzyl-L-cysteine on Pt {111} was studied using a high resolution x-ray photoelectron microscope at the synchrotron in Taiwan. Intact cysteine is adhered to the substrate predominantly in its zwitterionic form through the thiol group. More than one layer of cysteine is assembled on the surface. Similarly, benzyl-cysteine formed multi layers on the Pt substrate, with the majority of molecules zwitterionic. Chemisorbed molecules, however, are decomposed in the deposition process, through C-S bond cleavage. Radiation damage to these surfaces from exposure to x-ray radiation is observed. The amino and carboxyl groups appear to be most sensitive to damage from irradiation.

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