A HREELS investigation of MnO_x/Rh(100) model catalyst

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A HREELS investigation of MnO_x/Rh(100) model catalyst

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Abstract

The structure and physical chemical properties of the MnO_x/Rh(100) model catalysts, as well as O/Rh(100), have been investigated in this work using high-resolution electron energy loss spectroscopy (HREELS), low energy electron diffraction (LEED), and Auger electron spectroscopy (AES) techniques. The results show that the oxidation of the Rh(100) surface leads to form a trilayer O-Rh-O surface oxide. The MnO_x grows in a layer-by-layer mode on the Rh(100) surface, and forms an O-Mn-O- like trilayer structure as evidenced by the HREELS phonon features. The MnO_x with sub-monolayer coverage is stable on the Rh(100) surface. The HREELS phonon features with peaks at 68 and 83 meV indicate that Mn_3O_4 structure forms at higher overage. The Mn_3O_4 structure was found to be stable by annealing at 800K.

Key word: Rhodium oxide; Manganese oxide; Rh(100); HREELS; AES

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