

The adsorption of Nitric Oxide(NO) and Carbon Monoxide(CO) on Pt(111) Surfaces by the Thermal Desorption Spectroscopy

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The adsorptions of nitric oxide and carbon monoxide on Pt(111) surfaces have been studied by using LEED, AES, and TDS(thermal desorption spectroscopy).

The adsorbed species of NO is predominatly molecular on the Pt(111) surface at room temperature. A main desorption peak of TDS is attributed to the molecular adsorption at 360K, With increasing NO exposures, a shoulder peak at 480K which may be attributed to the defect site adsorption is appeared. The desorption rate order for NO desorption is 1st order and the desorption energy for NO calculated by Redhead equation assuming preexponential factor $\nu_1=10^{13}\text{s}^{-1}$ is 21.7 kcal/mol.

The adsorption of carbon monoxide is also molecular on Pt(111) surface at room temperature. The TDS results showed only a single broad peak at 460K, which is attributed to molecular adsorption. The desorption order for CO desorption is 1st order as well as NO and the desorption energy for CO is 28 kcal/mol.