The adsorption of nitric oxide on Pt(111) surface

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The adsorptions of nitric oxide(NO) on Pt(111) surfaces were investigated by using Low Energy Electron Diffraction, Auger Electron Spectroscopy, and Thermal Desorption Spectroscopy.

The adsorbed NO is predominantly molecular species on the perfect Pt(111) surface at room temperature. A main desorption peak of TDS is attributed to the molecular adsorption at 370K(α-state). With increasing NO exposures, a shoulder peak which might be attributed to the defect site adsorption is appeared at 450K(β-state). The chemisorption of NO is predominantly molecular on the Pt(111) surface, accompanied by a small amount of dissociation which becomes negligible when the Pt(111) surface is perfect.

When the Pt(111) surface is sputtered by Ar-ion with 2KeV, the thermal desorption spectrum becomes quite complex. The shoulder

peak, which appears on the perfect surface spectrum, increases with Ar-ion sputtering time. The maximum desorption spectra of N_2 are observed simultaneously between 370 and 450K. The increasing N_2 with the β-state of NO indicates that the β-state is a precursor to the NO dissociation.