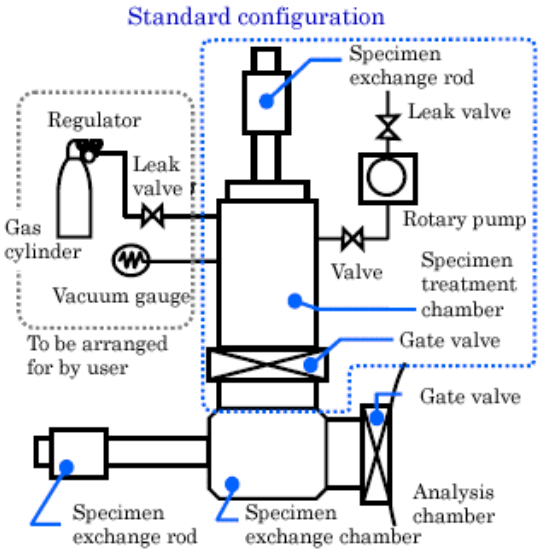
技術情報 Technical Information

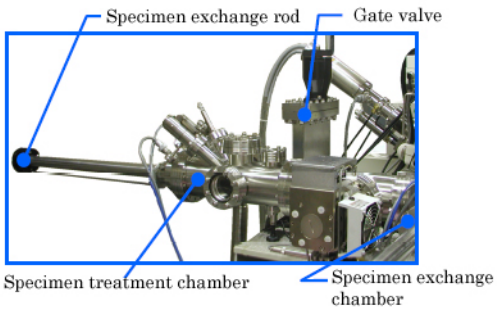
A New Specimen Treatment Chamber for XPS and Its Applications

A new specimen treatment system has been developed for the JPS-9010 series to be mounted to the rear of the specimen exchange chamber for various in-situ specimen treatments, including heating and gas reaction. Treated samples are loaded into the analysis chamber for XPS without being exposed to atmosphere.



Composition

The system consists of a specimen treatment chamber, gate valve, vacuum pump, and specimen exchange rod. The user is responsible for purchase of gas cylinders, leak valve, and vacuum gauge.



Heating

Samples are heated from top and bottom with a PG/RBN heater.

Heater: PG/PBN heater

Temperature: 400°C (in vacuum of 10^2 Pa)

Specimen size: 12 mm dia x 0.1 mm thick

Gas reaction treatment

Samples are loaded into the specimen treatment chamber for gas reaction treatment. The treatment

chamber is evacuated with a dedicated RP with the gate to the preparation chamber closed. The valve between the treatment chamber and RP controls the level of evacuation. Gases to be introduced are H_2, O_2, and N_2.(The user is responsible for the gas inlet system.)

Example of application

A Pd-In/SiO_2 catalyst, after hydrogen reduction, was reacted in the in-situ cell to a mixture of NO=CO=30 Torr at 100, 200, and 300°C, and the resulting Pd and In spectra were compared. Pd shifted approximately 0.5 eV toward the high energy range, suggesting that electrons were given away to the added gas.(Data courtesy of Dr. Naito, Department of Applied Chemistry, School of Engineering, Kanagawa University).

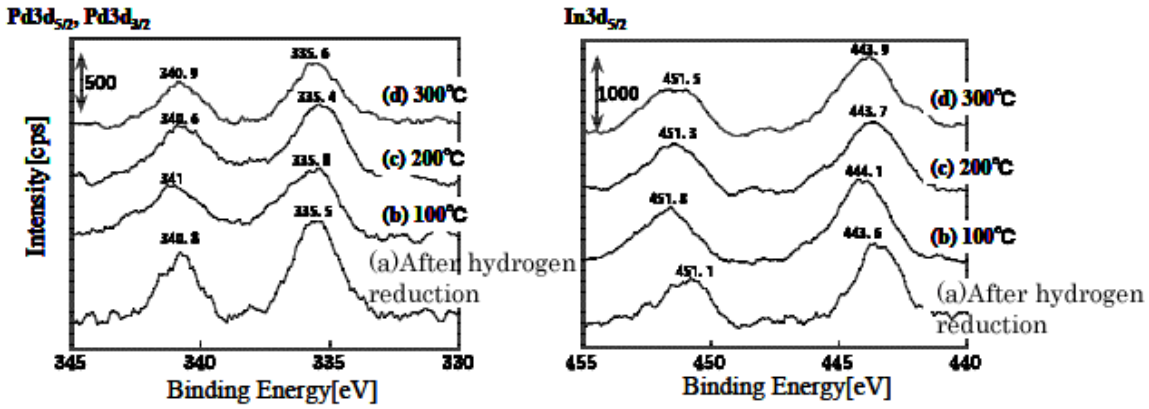


Figure XPS results of Pd-In/SiO_2 catalyst after NO-CO reaction