Development of a Sub-Micron Resolution EUPS (EUV Photoelectron Spectroscopy) System

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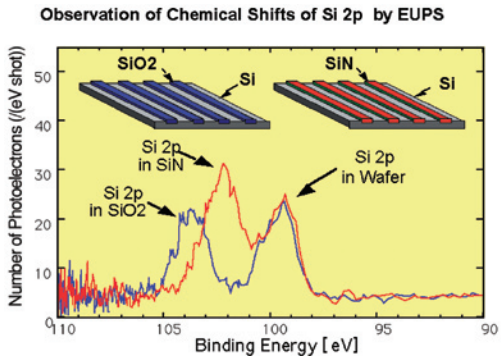
Photoelectron spectrum (PS) has been obtained from a sample irradiated with a sub-micron EUV beam. In EUPS devised at AIST, a sample is irradiated by a narrow line-emission from a laser-plasma source and the energy of emitted photoelectrons is analyzed by Time-Of-Flight. High efficiencies in the use of a photon source and electron energy analysis enables us to acquire high-spatial-resolution PS. As seen in the Figure, the energy resolution of EUPS is high enough. By forming a micro beam with a multilayer coated Schwarzschild optics, we can achieve sub-micron spatial resolution. By collecting photoelectrons with high efficiency by employing a magnetic bottle, we succeeded in obtaining a decent PS.



Chemical shift of Si 2p is easily observed in EUPS using a 4.8nm line emission.
The irradiated area on sample was several millimeter in diameter.
Energy resolution better than 0.5 eV has been confirmed in other spectra.

Realization of the Triple Point of Equilibrium Hydrogen using New-Generation Sealed Cells

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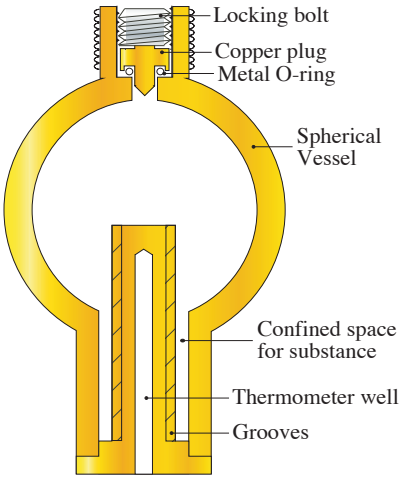
New generation sealed cells have been developed at AIST, which are used for realization of low temperature fixed points of the International Temperature Scale of 1990. The triple point of equilibrium hydrogen (e-H_2), one of the fixed points, is realized using the sealed cells containing ferric oxy-hydroxide as a catalyst for the ortho-para equilibration. The reduction of the amount of the catalyst suppresses a heat-capacity anomaly due to an interaction between hydrogen and catalyst at temperatures just below the triple point and allows one to obtain more reliable melting curves for e-H_2.

references

[1]Nakano T., Tamura O. and Sakurai H., in: Temperature, its Measurement and Control in Science and Industry, Vol. 7, 2003, American Institute of Physics, (in press).
[2]Nakano T., Tamura O. and Sakurai H., T. SICE 38, 2002, pp. 947-951.
[3]Nakano T., Tew W., Tamura O. and Sakurai H. in Proceedings of 15th Symposium on Thermophysical Properties, 2003, Boulder (to be submitted).
[4]Nakano T., Tamura O. and Sakurai H., in Proceedings of 2nd International Seminar on Low Temperature Thermometry, 2003, Wolclaw (to be published).



Schematic side view of new-generation sealed cell