The Recent Activities in XHV(Extremely High Vacuum)Technique in Japan

G.Horikoshi

Tsukuba College of Technology

The term of XHV means a pressure range less than 10E-10 Pa. in the past such an extreme condition as low as 10e-10 Pa or less couldn't measure by any types of pressure gauge and, as result.There had been any positive proposal to utilize such an extremely low pressure condition. In 1987 FY, a national project to promote XHV technique has started in Japan under the guidance of Science and Technoloogy Agency. The project covers all problems concerning with material development,production,measurement and application of XHV. The project has continued two periods of 3 years each and will end this March with so many successful results.I have been committed the project as a member of Promoting Committee of the project. Now I present some of the results of the XHV activities as well as a brief perspectives of XHV.

The group is divided into three, that is XHV production group, XHV measurment group and XHV utilization group. Each group has several theme. The details with an informal tentative title are as follows:

1.XHV production group.

(1) Improvement of Sputter Ion Pump for XHV

(2) Improvement to reduce the cryopanel temperature down to 3K level in cryopump.

(3) Precise evaluation of outgassing rate in vacuum pump under very low operating condition by means of conductance modulation method.

(4) Regulation and evaluation of outgassing rate from materials for XHV.

(5) Dynamic regulation and evaluation of outgassing rate.

(6) Development of clad plate of Al alloy and pure Al as an XHV material.

2.XHV measurement group.

(1) Development of cold emitter as an electron source of XHV pressure gauge.

(2) A novel type of cold cathode gauge.

(3) A novel XHV cold cathode gauge.

(4) A novel XHV measurement by means of LASER exeitation.

3.Utilization of XHV.

(1) Development and evaluation of microactuator.

(2) Development of lubricant in XHV.

(3) Development and evaluation of ultra-clean surface.