

## Surface Structure Analysis of Solid Liquid Interfaces

Masashi Nakamura, Osamu Endou, Ohta Toshiaki  
and Masatoki Ito\*

Faculty of Science and Technology, Keio University  
Graduate School of Science, Tokyo University

As the second trial at BL09XU beamline, we studied  $\sqrt{7}\times\sqrt{7}$ -Pt(111)-I in H<sub>2</sub>SO<sub>4</sub> solution. Prior to in-situ SXD measurements, the super structure of iodine  $\sqrt{7}\times\sqrt{7}$  on Pt(111) has been confirmed by in-situ scanning tunnelling microscope(STM) and cyclic voltammogram. From a STM image, the size of  $\sqrt{7}\times\sqrt{7}$  super structure was 8 nm in average which is not well ordered.

The single crystal(2mmx 10mm diameter) was sealed using a 4 $\mu$ -Prolene X-ray window film.

Wavelength of 1.30 Å was used with in-plane geometry.

Fig.1 — (3/7, 6/7, 0.2) —

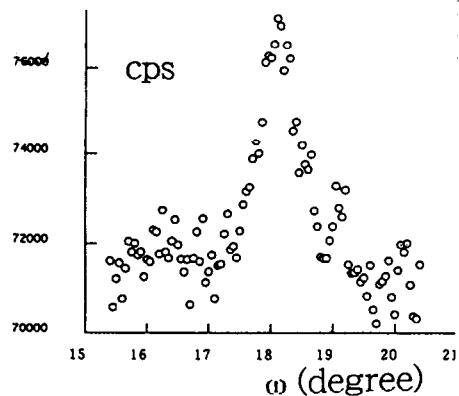


Fig.1 shows the result for the low ordered diffraction peak(3/7,6/7,0.2) for a  $\sqrt{7}\times\sqrt{7}$ -Pt(111)-I. The weak intensity(~2500cps) due to adsorbed iodine atoms on Pt(111) coupled with a broad half width of a locking curve(~0.8 degree) can be explained by the small ordered domain sizes of the adsorbed iodine super structure. This means that one should use a Pt(111) of which the terrace extends over. Fig. 2 also shows the result for the peak (1/3,1/3,0.05) of a  $\sqrt{3}\times\sqrt{3}$ -Au(111)-I. The weak and broad peak of iodine super-structure is also interpreted by the irregular iodine structures on Au(111) electrode.

Fig.2 — (1/3, 1/3, 0.05) —

