TOKAI CROSS Experimental Report J-PARC	提出日 Date of Report 28/03/2013
課題番号 Project No. 2012A0153 実験課題名 Title of experiment Study on estimation of incoherent scattering on the TAIKAN 実験責任者名 Name of principal investigator Hiroki Iwase 所属 Affiliation CROSS-TOKAI	装置責任者 Name of responsible person Jun-ichi Suzuki 装置名 Name of Instrument/(BL No.) TAIKAN 実施日時 Date and time of Experiment 28/10/2012 – 02/11/2012

試料、実験方法、利用の結果得られた主なデータ、考察、結論等を、記述して下さい。(適宜、図表添付のこと)
Please report your samples, experimental method and results, discussion and conclusions. Please add figures and tables for better explanation.

1. 試料 Name of sample(s) and chemical formula, or compositions including physical form.

Three sample sets were measured: (1) H_2O/D_2O mixtures (volume ratio: 100/0, 80/20, 60/40, 40/60, 80/20, 0/100), (2) hemoglobin in a 20mM phosphate buffer (D_2O), (3) polystyrene latex in H_2O. The sample thicknesses were 0.1, 0.2, and 0.4 cm, respectively.

2. 実験方法及び結果（実験がうまくいかなかった場合、その理由を記述してください。）
Experimental method and results. If you failed to conduct experiment as planned, please describe reasons.

Experimental

SANS experiments were performed on a small-angle neutron scattering instrument (TAIKAN) installed at BL15 in the MLF Facility in J-PARC. A standard auto sample changer was used. A total covered Q range was from 0.01 to 2.0 $Å^{-1}$. All SANS measurements were performed at an ambient temperature. The exposure time for each sample was 1.5 hours. After subtracting cell scattering, we converted the scattering intensity to the absolute intensity per sample volume by using a secondary standard of glassy carbon.

Results

Figure 1 shows wavelength-dependence of transmission for H_2O with thickness of 1 mm and 2mm. The solid lines in Figure 5 are transmission results obtained by SWAN at KENS. The transmissions detected by N_2 beam monitor on the TAIKAN agree with the results obtained by SWAN.

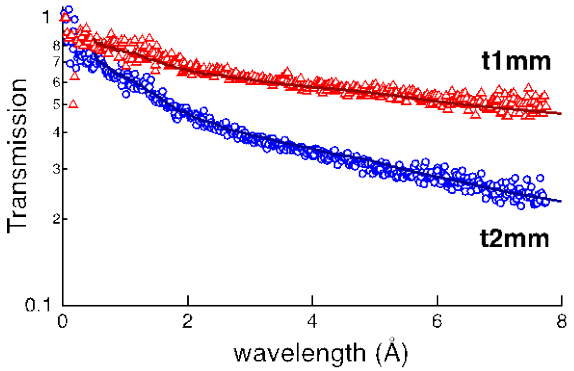

Figure 1. Transmission of H_2O. The sample thickness were (○) 0.1 and (△) 0.2mm. The solid lines were previous results obtained by SWAN at KENS.

Figure 2 shows the wavelength dependence of the SANS profile (incoherent scattering) for H_2O with a thickness of 1 mm. The present SANS profiles were obtained using a small-angle detector bank at L_2 = 5.56 m. A significant decrease in the scattering intensity was observed in the Q-range of Q < 0.03 $Å^{-1}$ caused by the background scattering. Except for this Q region, the obtained incoherent intensities were almost flat. However, the incoherent scattering intensity was lower compared with previous results. We are now re-checking the analysis program. By increasing the wavelength, the SANS intensity gradually increased. It is known that this increase in wavelength -dependence of an incoherent intensity is primarily caused by inelastic scattering, a recoil effect, and a multiple scattering. Analysis of other experimental measurements is now in progress.

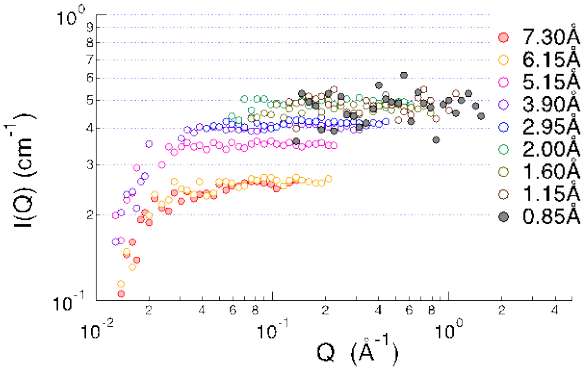

Figure 2. Wavelength dependence of SANS profile for H_2O (thickness of 1mm).