 MLF Experimental Report	提出日 Date of Report 2010.8.9
課題番号 Project No. 2010A0077 実験課題名 Title of experiment Salt distribution at the interface between water and organic solvent 実験責任者名 Name of principal investigator Hideki Seto 所属 Affiliation IMSS, KEK	装置責任者 Name of responsible person Norifumi L. Yamada 装置名 Name of Instrument/(BL No.) BL-16 実施日 Date of Experiment 2010.6.7

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.
<p>① Deuterium Oxide (D_2O, liquid)</p> <p>② Deuterium Oxide + nitrobenzene ($D_2O + C_6H_5NO_2$, liquid, the volume fraction of nitrobenzene is 50%)</p> <p>③ Deuterium Oxide + sodium tetraphenylborate ($D_2O + C_{24}H_{20}BNa$, liquid, the concentration of sodium tetraphenylborate is 300 mM)</p>

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.
<p>In order to investigate a liquid-liquid interface, we prepared a sample cell made of aluminum with the thickness of 8 mm. As the first measurement, the surface of deuterium oxide was investigated but no reasonable reflectivity signal was observed. Either, the reflectivity signal from the interface between deuterium oxide and nitrobenzene was not observed. These results could be due to the curved interface at the walls of the sample cell.</p> <p>It is not possible to solve the problem within the beam time, we tried to investigate the reflectivity from the liquid surface on a small plastic bowl. The samples are deuterium oxides with and without sodium tetraphenylborate (300 mM). Figure 1 indicates the reflectivity data obtained from the pure deuterium oxide. The data points at higher-Q are proportional to Q^{-4} as a standard flat surface. On the other hand, the reflectivity data from the deuterium oxide with sodium tetraphenyl borate ($NaBPh_4$) are shown in Fig. 2. By comparing with Fig. 1, some deviations are observed around $Q = 2nm^{-1}$. This might be due to the difference of the surface structures of these samples, and we will confirm by further experiments in the future.</p>

2. 実験方法及び結果(つづき) Experimental method and results (continued)

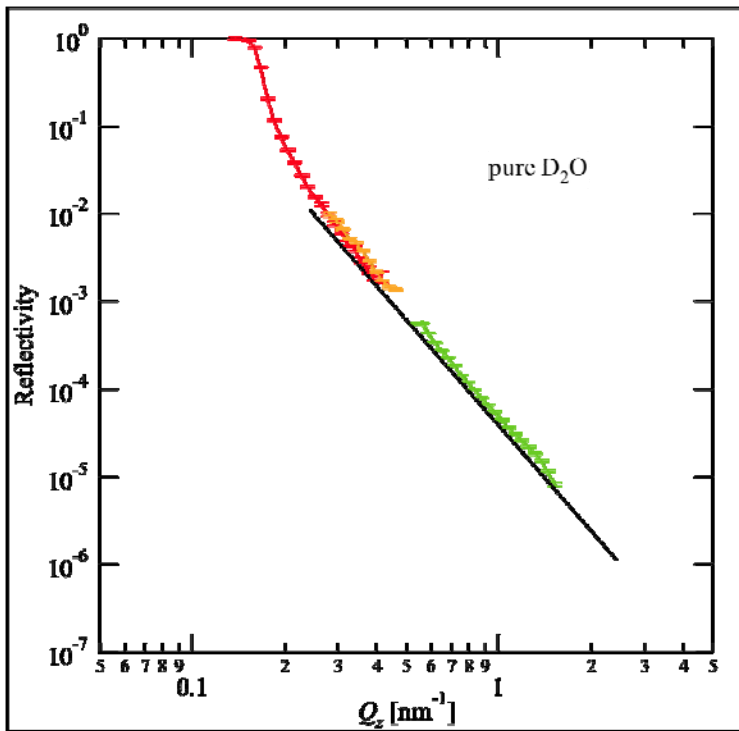


Fig. 1 Neutron reflectivity data from the surface of deuterium oxide without sodium tetraphenyl borate.

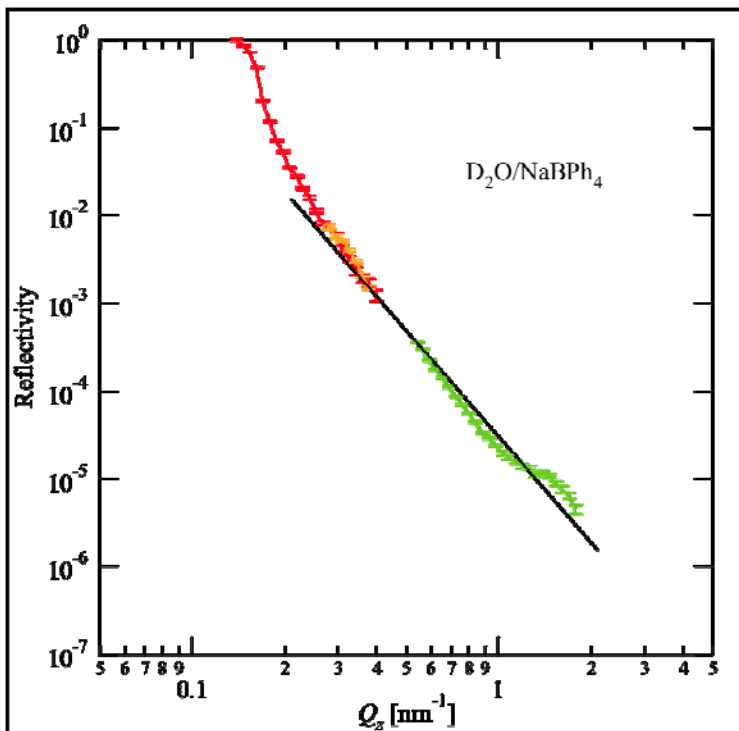


Fig. 2 Neutron reflectivity data from the surface of deuterium oxide with sodium tetraphenyl borate.