 <b>MLF Experimental Report</b>	提出日 Date of Report
課題番号 Project No. 2015A0190 実験課題名 Title of experiment Mechanistic aspects of ion diffusion in new oxide-ion conductors by high temperature and high resolution neutron diffraction 実験責任者名 Name of principal investigator Kotaro Fujii 所属 Affiliation Tokyo Institute of Technology	装置責任者 Name of responsible person Torii Shuki 装置名 Name of Instrument/(BL No.) SuperHRPD / BL-08 実施日 Date of Experiment May 11-May 17, 2016

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.
Sintered pellets of $A_2BO_4$ -based materials ( $A$ : Nd, Ho and/or Sr; $B$ : Al or Ti) and the $Yb_2Ti_2O_7$ -related material were used for the experiments.

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><b>Experimental methods</b></p> <p>Time-of-flight (TOF) neutron powder diffraction data of <math>A_2BO_4</math>-based materials (<math>A</math>: Nd, Ho and/or Sr; <math>B</math>: Al or Ti) and the <math>Yb_2Ti_2O_7</math>-related material were measured at room temperature and high temperature by a high-resolution neutron powder diffractometer SuperHRPD installed at the beam line BL08 of J-PARC facility, Japan. The sintered samples were put into 10 mm <math>\phi</math> vanadium sample holders and were used for the diffraction measurements. The diffraction measurements were carried out with five frame mode.</p> <p><b>Experimental results</b></p> <p>TOF-neutron data of <math>Yb_2Ti_2O_7</math>-related material measured at 23 °C were analyzed using the program Z-Code. As shown in Figure 1, it gave good quality of fitting by space group <math>Fm\bar{3}m</math> giving <math>R</math>-factors; <math>R_{wp} = 0.1080</math> and <math>R_B = 0.0678</math>). The structure analysis of the high-temperature data are in progress. Also, the structure analyses of the diffraction data of the other materials are also on-going.</p>

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

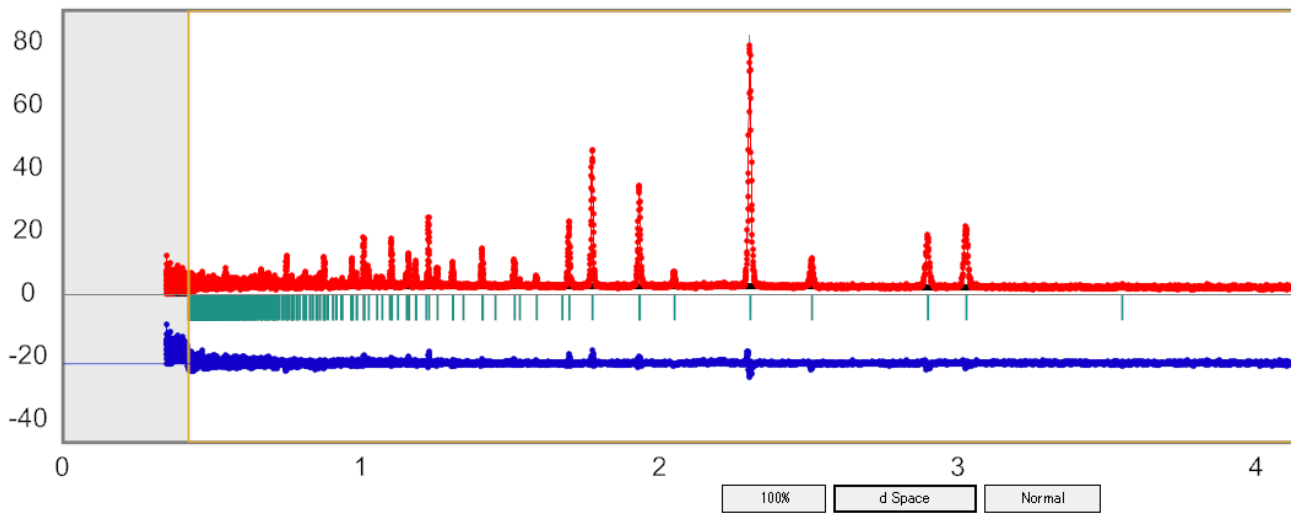


Figure 1 : Rietveld plot of  $\text{Yb}_2\text{Ti}_2\text{O}_7$ -related material measured at 23 °C.