


(※本報告書は英語で記述してください。ただし、産業利用課題として採択されている方は日本語で記述していただいても結構です。)

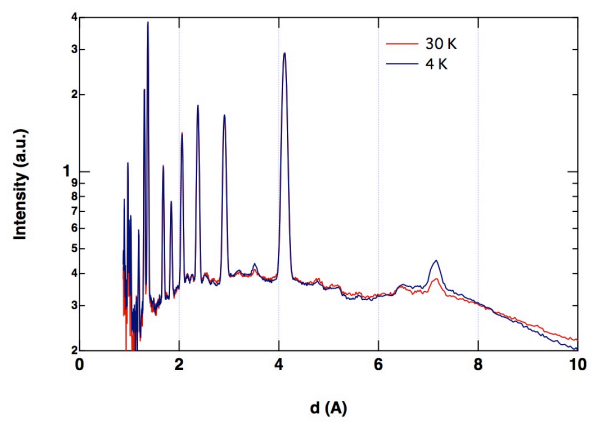
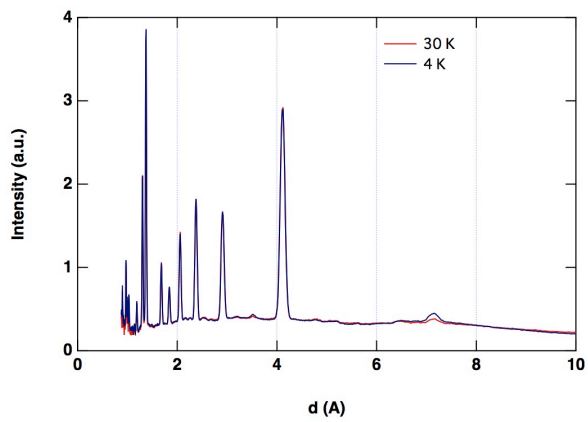
 MLF Experimental Report	提出日 Date of Report 2014.09.24
課題番号 Project No. 2014A0255 実験課題名 Title of experiment Determination of magnetic structure in zero-field of the anti-ferromagnet TbB ₆ showing multi-step magnetization 実験責任者名 Name of principal investigator Fumitoshi Iga 所属 Affiliation Ibaraki University	装置責任者 Name of responsible person Toru Ishigaki 装置名 Name of Instrument/(BL No.) iMATERIA(BL-20) 実施日 Date of Experiment 2014.05.12-2014.05.13

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.
Name of sample(s) and chemical formula: TbB ₆ a= b = c= 4.105 Angstrom , $\alpha = \beta = \gamma = 90$ degree CsCl-type (Simple Cubic) Space group : Pm3m Powder sample, harmless, Volume = 3 cc, 8 gram They are encapsuled in a Vanadium Cell

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 method: powder diffraction (elastic) wave length : 0.2 ~ 10Å d<8Å . T≒5K (lowest temperature), 25K and 300K, because of T _N =22K of TbB ₆ . Pressure = 0.1MPa, Field B = 0T TbB ₆ was expected to show the typical antiferro-magnetic ordered state below T _N =22K. Some nuclear peaks of TbB ₆ were observed at room temperature, but the peaks expected below 22K were not observed except ones originated from impurity phase of TbB ₄ . Thermometer displayed about 4K, but this was touched the outside of the vanadium cell. If thermal exchange-gas was insufficiently contained, powder sample inside was not cooled below T _N =22K. The two figures obtained from 90-degree bank shows that sample did not reach the magnetic ordered state.

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



Sample was set into the vanadium cell at Friday night after introducing helium gas in the glove box. Vanadium cell was sealed by Indium wire, that is a standard method for low temperature neutron experiment. Then, there is a possibility that indium seal is failed. Then, we hope to retry this experiment if we have the chance.