（ ※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。 ）

J-PARC **MLF Experimental Report**	提出日 Date of Report
課題番号 Project No. 2013B0206 実験課題名 Title of experiment Local structure of CuNi alloy; a possible replacement candidate for Pd 実験責任者名 Name of principal investigator Taku J Sato 所属 Affiliation IMRAM, Tohoku University	装置責任者 Name of responsible person Toshiya Otomo 装置名 Name of Instrument/（BL No.） NOVA/BL21 実施日 Date of Experiment 2014/03/30-2014/04/01

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.
CuNi alloy prepared using immersion alloying method Bulk CuNi alloy prepared using arc melting method CuNi alloy prepared using reduction oxidation method (redox)

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.

　The three samples have different forms due to the different sample preparation methods; the immersion alloying one is in the powder form, the bulk CuNi is a chunk, and reduction oxidation one is in the ribbon form. All the samples are filled in the standard VNi sample can.　The mass of the samples are 1.276 g for the immersion alloying, 1.102 g for the bulk CuNi, whereas only 0.167 g was used for the reduction oxidization one. These samples, together with some supplemental samples, empty cell, and vanadium standard, are set to the room temperature sample changer.

　After obtaining the raw diffraction data, background was subtracted using the empty can data, and standard corrections were made to obtain $S(Q)$, such as wavelength dependent absorption, $I(\lambda)$, multiple scattering, and incoherent scattering corrections.　Resulting $S(Q)$ of the three samples are shown in Figs. 1, 2 and 3, whereas $S(Q)$ in the low-Q region is magnified in Fig. 4.　It should be noted that the density correction was not made, and hence absolute intensity was not obtained to date.　Nonetheless, there appears clear difference in the peak shape of the immersion alloying and reduction oxidization samples, compared with the bulk CuNi.　In particular, possible peak splittings were observed in the reduction oxidation sample.

After obtaining reliable S(Q) for all the samples, we will try PDF and Rietveld analyses to elucidate its local structure, as well as average crystal structure difference, due to the different sample-preparation methods.
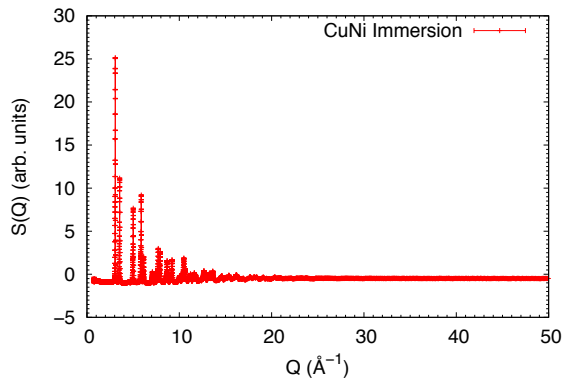

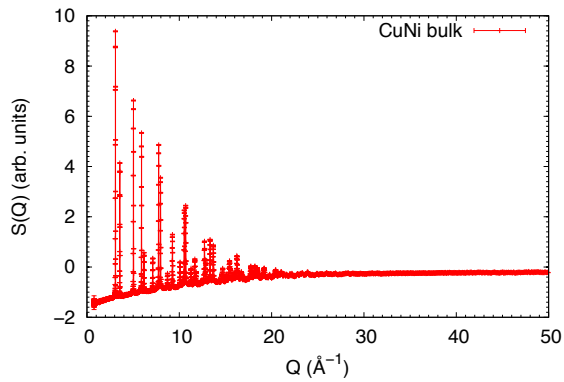Fig. 1: S(Q) from the CuNi alloy obtained using the immersion alloying method.

Fig. 2: S(Q) from the bulk CuNi alloy obtained using the arc melting method.
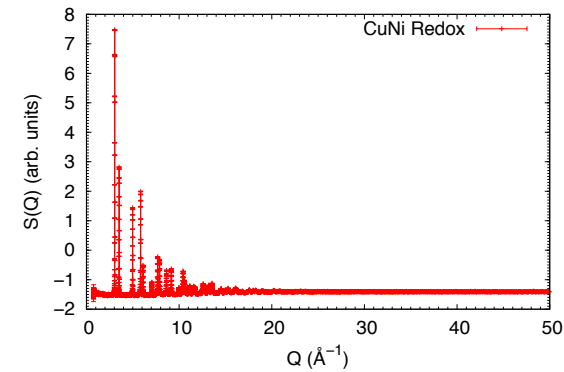

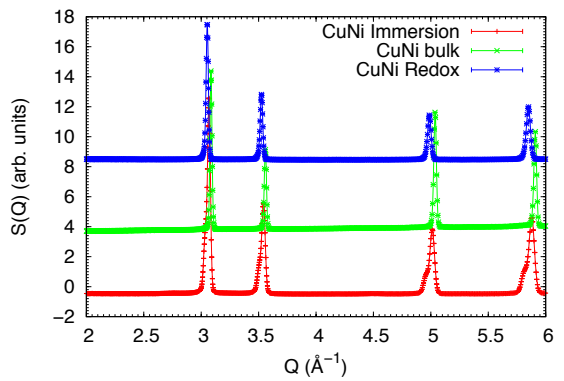Fig. 3: S(Q) from the CuNi alloy obtained using the reduction oxidization method.

Fig. 4: Comparison of S(Q) from the three samples.