

## **Final report on the short-stay study at Peking University**

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The high ionic conductor,  $\text{LnBaCo}_2\text{O}_{5+x}$ , was chosen for my doctoral course research, so sample of high crystalline quality is required. As a student of physics, I have no experience in chemical synthesis and then I have to learn it from the beginning. We established collaboration with Prof. Wang's group of Peking University. The group have been studying in inorganic chemistry with a long history and has very nice instrument in synthesis and properties measurement. Moreover, they are experienced chemists and would help me a lot for my studying of chemical synthesis. I went to the laboratory in April, 2012, and started the learning of synthesis. In the end I got several samples back and conducted the neutron powder diffraction measurement. But I found that the crystalline quality of the samples is still not good enough and the oxygen contents are not well controlled, either. So it is necessary to go there again to improve my synthesis skills and find a way to control the oxygen content.

As the short-stay study abroad program was calling for participant in July, 2012, I felt that it could be a very good opportunity for me to go to Peking University and learn synthesis again. So I talked with Prof. Wang about this opportunity and she was very happy to host me again. Then I applied for this program with my supervisor, Takashi Kamiyama.

This business trip in Peking University has two objectives:

1. Improve the crystalline quality of  $\text{LnBaCo}_2\text{O}_{5+x}$ .
2. Precisely control the oxygen content of  $\text{LnBaCo}_2\text{O}_{5+x}$  to 5.5.

I spent most of my time in the chemical laboratory doing experiment and having discussion with Prof. Wang. I have to find an optimized synthesis condition for my

two objectives. The only way is trial-and-error method. The experiment was not going as smoothly as we expected, so I did a lot of synthesis in different conditions.

During my stay, I also joined their group meeting and tried to learn what they are doing. As Peking University is very famous in China, many good lectures are held there. I attended some of them, enjoying a lot.

Life in Beijing was busy but very happy. I stayed in the students' dormitory and had chance to talk with students of my age, which was quite interesting. Food in Beijing was also fantastic. We went to many restaurants and enjoyed the various dishes.

Time went fast! Five-week study soon came to the end. Fortunately, in the last minute, I succeeded in accomplishing the two objectives and obtained the sample I wanted.