

## Returnee's Report

Name :	Shinji HARA
Status :	Masters year 1 Nagoya Institute of Technology
Name of Exchange University :	SPCTS/University of Limoges
Research Theme :	Preparation of Highly <i>c</i> -Axis-Oriented Apatite-Type Lanthanum Silicate Polycrystals by Combined Use of Reactive Diffusion and Tape Casting
Duration :	2013/ 9/2~2013/11/15 (75days)
NITECH Faculty Advisor :	Prof. Koichiro FUKUDA
Exchange University Faculty Advisor :	Prof. Philippe THOMAS
<p>Research Theme in detail :</p> <p>&lt;Goal&gt;</p> <p>The reactive diffusion technique could be used as a new facile and advanced texturing method for the syntheses of highly grain-oriented ceramics. To make this technique being more generalized, we have combined it with the tape casting method for the preparation of grain-aligned apatite-type lanthanum silicate(LSO) polycrystals. We have clarified the effects of grain size, stacking pressure and residual organics on the orientation degree.</p> <p>&lt;Result&gt;</p> <p>With the annealed couples consisting of pellet A/pellet B and pellet A/tape B, the highly oriented LSO polycrystals were formed at the original contact boundaries. On the other hand, for the annealed couples of tape A/pellet B and tape A/tape B, the LSO crystal grains aligned only in the regions B; the LSO grains that were formed in the tape A regions were randomly orientated. These results suggest that the residual organics in the tape A region played an important role on the grain alignment, while both grain size and stacking pressure had trivial effects on texturing. The nucleation and growth mechanism of LSO would be affected by the residual organics, which should be examined in more detail for the complete clarification.</p> <p>&lt;Achievement&gt;</p> <p>In this study, we clarified that the grain size and the pressure is not important for the orientation and the organics have some negative effect on that. In future, we must modify the synthesis process to avoid the negative effect of the organics.</p>	
About the laboratory I was sent to (number of faculty and students, methods used in	

research activity :

- Number of faculty: 3
- Number of members: Around 40
- Methods used in research activity: Most of students who belong to some laboratory are doctor, so they usually work alone
- The discussion will be held whenever someone wants
- Everyone usually comes to university around 8:30 and goes home around 18:00.
- When I want to collect data with special equipment(XRD, SEM, TEM etc.), I must ask technical staff who is responsible for equipment to collect the data.

Comments about the workshops and seminars I attended :

- Nothing

My Ambitions :

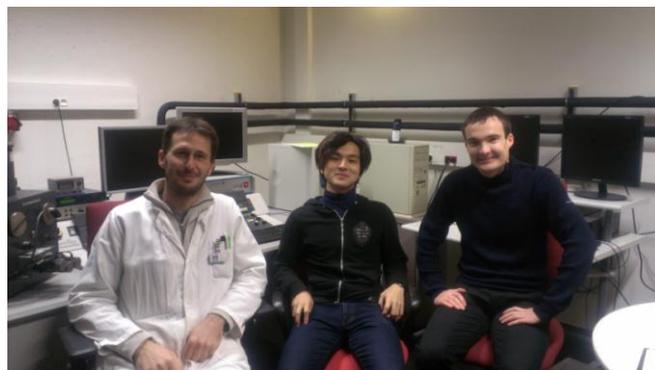
- In this study, I studied the apatite phase was oriented or not, so I want to investigate the difference of the Lotgering factor.

Advice and suggestions for young researchers who will go to exchange universities :

- You must learn the skill for living alone before you study abroad.
- It should be better for you to know basic acknowledgement about local language.
- You had better to be active because you can do nothing unless you act.



The view of meeting



People who took care of me