

## Returnee's Report

Name :	Yuta Noda
Status :	Masters year 1, Nagoya Institute of Technology
Name of Exchange University :	i-MEET, FAU
Research Theme :	Synthesis and characterization of $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}$ phosphor synthesized by a solid state and co-precipitation method.
Duration :	2013/ 9/29~2013/12/28 (90days)
NITECH Faculty Advisor :	Assoc. Prof. Tomokatsu Hayakawa
Exchange University Faculty Advisor :	Priv.-Doz. Mirosław Batentshuk
<p>Research Theme in detail :</p> <p>&lt;Goal&gt;</p> <p><math>\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}</math> is a high efficient green light phosphor and this can be applied to white light emitting diodes (LEDs) and light converter for solar cells (SCs).</p> <p>In my research trainee, <math>\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}</math> phosphor was attempted to be synthesized by a solid state and co-precipitation method. And we analyzed them with photoluminescence spectroscopy, X-ray diffraction and scanning electron microscopy. And as a simple application, we attempted to fabricate thin film using the sample synthesized by solid state.</p> <p>&lt;Result&gt;</p> <p>According to PL spectroscopic analysis, the sample synthesized by a solid state emitted green photoluminescence (520 nm), while the sample synthesized by a co-precipitation method emitted bluish photoluminescence (490 nm). It is known that typical <math>\text{SrAl}_2\text{O}_4</math> has a stuffed tridymite structure, but the sample synthesized by a co-precipitation method was found to have with three different phases (Monoclinic, Orthorhombic and Hexagonal). And sizes of the sample synthesized by a co-precipitation method were in sub-micron and micron order co-precipitation and solid state method, respectively. There were reasons why the two samples exhibited the difference of PL properties. Additionally, we could fabricate a thin film of the <math>\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}</math> phosphor, with a good quality.</p> <p>&lt;Achievement&gt;</p> <p>We cleared the differences between the samples with two different methods. Two kinds of synthesis method (co-precipitation and solid state reaction) were applied for the synthesis of phosphors, which were found to exhibit different PL properties (bluish and green respectively) due to their size-variation and phase-change.</p>	
About the laboratory I was sent to (number of faculty and students, methods used in	

research activity :

Chair: Prof. Dr. Christoph J. Brabec

Supervisor: Priv.-Doz. Dr. Mirosław Batentshuk

Constitution member: About 70 researchers in i-MEET.

Work style: Relatively free, but every people work efficiently

Comments about the workshops and seminars I attended :

Meeting ZAE, WW6

My Ambitions :

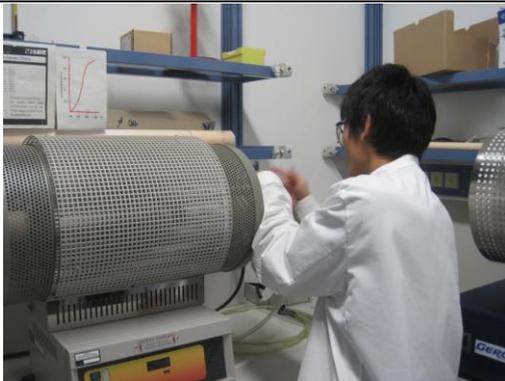
I think we will continue studying and collaborate from now.

And, to go and join in i-MEET again, I will make a opportunity.

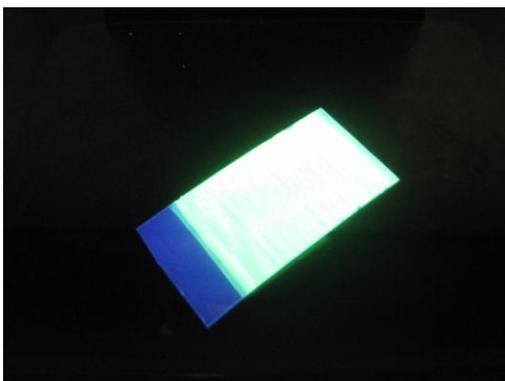
Advice and suggestions for young researchers who will go to exchange universities :

We can talk about something in English to most people, but some specialists only use Germany in order to teach precisely. But some supervisors and helping students give a translation for us.

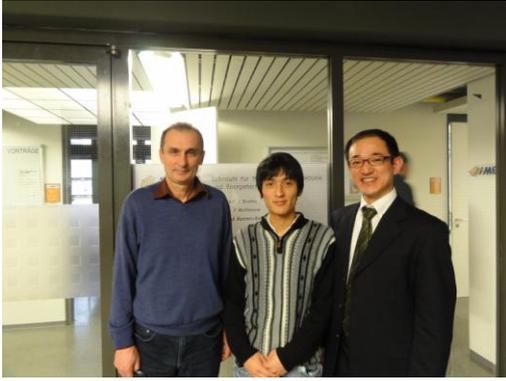
They work efficiently, so many people use their time freely. If you have something to talk about, you should e-mail someone and confirm something.



Picture1. Tubular furnace



Picture 2. Phosphor film



Picture 3. After the lecture by Prof. Hayakawa