

## Returnee's Report

Name :	Keisuke NAUCHI
Status :	Masters year 1 Nagoya Institute of Technology
Name of Exchange University :	Imperial College London
Research Theme :	Thin film growth of metal oxides
Duration :	2013/ 9/4~2013/12/2 (90days)
NITECH Faculty Advisor :	Prof. Yuji IWAMOTO
Exchange University Faculty Advisor :	Dr. Martyn A. McLachlan
Research Theme in detail :	
<p>&lt;Goal&gt;</p> <p>During the last few years, transition metal oxides such as molybdenum tri-oxide, vanadium pent-oxide or tungsten tri-oxide have been extensively studied because of their exceptional electronic properties for charge injection and extraction in organic electronic devices. These unique properties have led to the performance enhancement of several types of devices and to a variety of novel applications.</p> <p>In this study, I studied about growth of MoO<sub>3</sub> thin film aiming for application of organic light emitting diodes. I synthesized MoO<sub>3</sub> thin film by using spray pyrolysis. Unlike many other film deposition techniques, spray pyrolysis offers an extremely easy technique for preparing films of any composition and does not require high-quality substrates. Therefore, the spray pyrolysis method has been used for a variety of growth of thin film. But, the property of thin films synthesized by this method depends on the synthetic condition, especially substrate temperature and precursor solution. So, I studied about the influence by changing substrate temperature and precursor solution.</p> <p>&lt;Result&gt;</p> <p>In this study, MoO<sub>3</sub> thin films (mol concentration M = 0.1, 0.05, 0.025) were synthesized by using spray pyrolysis at from 100 to 500 °C by the 100 °C. The UV-vis. Spectroscopic analysis of the synthesized samples revealed that the largest energy absorption was achieved for the 300 °C-synthesized sample with the deepest grey color. These results suggested that the optimum MoO<sub>3</sub> thin film growth temperature was approximately 300 °C.</p> <p>As a feature plan, crystallinity and electron structure analyses by the XRD and Hall measurements are considered to be essential for improving the quality of MoO<sub>3</sub> thin film.</p>	

About the laboratory I was sent to (number of faculty and students, methods used in research activity):

Number of faculty and students : About 10 people

Methods used in research activity : I researched with discussing with PhD student. In addition, we had group meeting once a week.

Comments about the workshops and seminars I attended:

Nothing

My Ambitions:

I could experience many things through this program. And I also found problems. In my future, I would like to challenge various things based on this experience.

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

In overseas, unlike Japan, you can't achieve anything if you don't take action in person.

You actively take action in person rather than wait for directions. Please spend your fulfilling overseas education life.



Fig.1 Experiment device

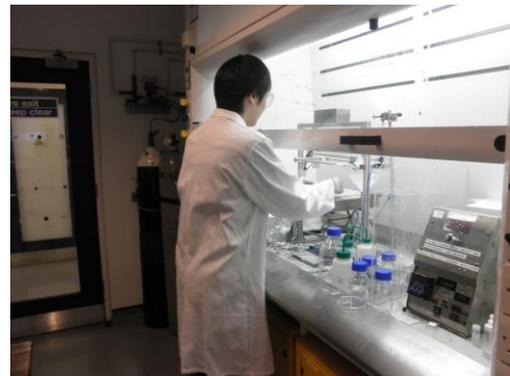


Fig.2 During the experiment



Fig.3 Picture with the students