

Hokkaido University Syllabus					
Course Title Applied Materials Chemistry (Inorganic Solid State Chemistry)					
Subtitle					
Instructor (Institution) Yuji MASUBUCHI (Faculty of Engineering)					
Other Instructors (Institution) Yuji MASUBUCHI (Faculty of Engineering)					
Course Type				Open To Other Faculties / Schools	OK
Year	2019	Semester	2nd Semester (Fall Term)	Course Number	094209
Type of Class	Lecture	Number of Credits	1	Year of Eligible Students	~
Eligible Department / Class				Other Information	
Numbering Code	CHEM_ELMAT 6122				
Major Category Code	Major Category Title CHEM_ELMAT Chemical Sciences and Engineering_Elective Course for Materials Chemistry				
Level Code	Level 6 Specialized Subjects (advanced) in graduate level (Master's Course and Professional Course)				
Middle Category Code	Middle Category Title 1				
Small Category Code	Small Category Title 2				
Language Type Classes are in Japanese and English (bilingual, or language is decided once the student composition has been finalized).					

Key Words

Sintering, Thin film, Single crystal, Nano materials, Morphology

Course Objectives

Inorganic solids are known to show various properties depending on their constituent elements and crystal structure. Additionally, from the viewpoint of "material" their morphology and microstructure must be optimized to achieve their applications. This lecture will be dealing with preparation process of sintered body, thin film, single crystal, and nano

materials for inorganic materials. We will also discuss how their physical properties relate to their morphology and micro structure.

■ ■ Course Goals

To understand a relationship between various properties and microstructure. To learn preparation methods of sintered body, thin film, single crystal, and nano materials. To understand fundamental mechanism of diffusion, nucleation, crystal growth, and grain growth.

■ ■ Course Schedule

1. Introduction: properties and morphology of inorganic solids
2. Sintering: solid and liquid phase diffusion, sintering of metal nitrides
3. Thin film: deposition process, vacuum deposition, vapor and liquid phase deposition
4. Single crystal: crystal growth mechanism, various crystal growth process
5. Nano material: properties, nano particles, composites, assemblage

■ ■ Homework

Students are encouraged to read the handouts which will be given prior to each class.

■ ■ Grading System

Examination 30% (on each lecture) and final report 70%

■ ■ Textbooks

適宜、資料を配付する。

■ ■ Reading List

■ ■ Websites

<http://www.eng.hokudai.ac.jp/labo/strchem/lectures.html>

■ ■ Website of Laboratory

■ ■ Additional Information

■ ■ Update

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