

Surface Science and Technology

2 units (selection)

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Target The purpose of this class is to understand the basic characteristics of surface and bulk and their differences, which are necessary in developing new material science.

Outline This class will introduce surface structures and surface phenomena, governing the physical properties of combustion catalysts, electrode materials for fuel cell, transparent conducting materials, phosphors and oxynitrides for photocatalysts, and fundamentals of surface modifications for advanced functional materials.

Style Portfolio

Keyword *bulk, surface, photocatalyst, transparent conducting oxide, solid oxide fuel cell, phosphor, X-ray photoelectron spectroscopy, X-ray absorption fine structure*

Fundamental Lecture “Physical Properties of Materials”(0.2), “Materials Process Engineering”(0.2), “Material Science”(0.2), “Advanced Materials Science”(0.2)

Relational Lecture “Advanced exercise on chemical science and technology”(0.5), “Advanced research on chemical science and technology”(0.5)

Requirement Nothing special.

Notice Reports should be submitted within two weeks after the assignment.

Goal To understand the outline of materials in which their surface structures and surface phenomena are effectively used.

Schedule

1. Orientation
2. Recent topics on metal oxynitrides for photocatalysts -1-
3. Recent topics on metal oxynitrides for photocatalysts -2-
4. Recent topics on transparent conducting oxides thin films -1-
5. Recent topics on transparent conducting oxides thin films -2-
6. Recent topics on transparent conducting oxides thin films -3-
7. Recent topics on X-ray spectroscopy -1-
8. Recent topics on X-ray spectroscopy -2-
9. Recent topics on X-ray spectroscopy -3-
10. Recent topics on phosphors for white LEDs -1-

11. Recent topics on phosphors for white LEDs -2-

12. Recent topics on combustion catalysts -1-

13. Recent topics on combustion catalysts -2-

14. Recent topics on electrode materials for fuel cells -1-

15. Recent topics on electrode materials for fuel cells -2-

16. Final reports, dissertational defense

Evaluation Criteria Assignment counts 100% based on the reports submitted and on the result of dissertational defense.

Textbook To be announced in the class.

Reference To be announced in the class.

Contents <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216855>

Student Able to be taken by student of other department

Contact

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