科目ナンバリング	U-LAS13 20014 LE60						
授業科目名<英訳>	Introduction to Surface Chemistry-E2 Introduction to surface chemistry-E2			担当者所属職名・氏名	理学研究科　准教授　THUERMER, Stephan		
群	自然科学科目群			分野(分類)	化学(発展)	使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・後期	曜時限	月3	配当学年	主として2回生	対象学生	理系向

[授業の概要・目的]

In this lecture we will learn about surface processes, which is an important topic in physics, chemistry and engineering. Surfaces are much more important than you would think: Rusting of metals (corrosion), sticking of your shoes or glue (adhesion and friction), washing your hands (surfactants), colorful paints (coatings) are all phenomena happening at some surface. In this course, we will learn how the special properties of surfaces makes all this possible and how chemists in science and industry try to control these properties.

[到達目標]

Students will gain the following from this lecture:
- Interest and fun to learn more about how things work in daily life
- An understanding of basic concepts of surface physics and surface chemistry
- The ability to connect knowledge to observed natural phenomena and industrial applications
- The ability to understand scientific terminologies and express their own ideas of natural sciences in English.

[授業計画と内容]

The course will cover the following topics in a total of 15 lectures / weeks (not including the final examination). The course schedule is subject to change depending on the student's understanding.

1) A cut through everything (2 weeks):
We will learn what surfaces and interfaces are, their properties and their importance for our daily life.
2) Sticking together (2 weeks):
We introduce surface energy and see how this leads to sticking and water repelling behavior.
3) How not to slip (1 week):
We learn about surface structure, and get an understanding of how friction between surfaces works.
4) Gear breakdown (2 weeks):
We get to know how friction leads to damage and how friction can be reduced.
5) Fogging up of glasses (2 weeks):
We discuss about adsorption of atoms and molecules on surfaces.
6) Exhaust transformation (2 weeks):
Chemical reactions on surfaces and catalysis will be discussed.
7) Sticky gas (3 weeks):
Finally, we see how adsorption of gas can be quantified and measured, and how this is used practically.
<<Final Examination>>
8) Feedback session (1 week):
After the final examination we will discuss the answers of the exam questions and resolve any open questions.

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Introduction to Surface Chemistry-E2(2)

[履修要件]

特になし

[成績評価の方法・観点]

Preparing the homework (40%)
Two short test during the lecture (20%)
Final examination (40%)

[教科書]

使用しない
No textbook is used. Some handouts will be provided during class.

[参考書等]

（参考書）
Hans-Juergen Butt, Karlheinz Graf, Michael Kappl 『Physics and Chemistry of Interfaces』 （Wiley-VCH） ISBN:9783527412167（This book covers all topics of this course and much more）
Drew Myers 『Surfaces, Interfaces, and Colloids: Principles and Applications, 2nd Edition』 （Wiley-VCH） ISBN:9780471330608（Covers most topics about surfaces and interfaces, be it solid, liquid or other surfaces）

Elaine M. McCash 『Surface Chemistry』 （Oxford University Press） ISBN:9780198503286（Introductory text about solid surfaces）

[授業外学修（予習・復習）等]

Students are expected to review the lecture handouts after each class and look up unknown English terms themselves. Homework assignments need to be prepared before the next lecture. It is also encouraged to refer to additional sources of information (books, websites) for the specific topics. If something is unclear or difficult, the instructor can be asked at any time.

[その他（オフィスアワー等）]

The lectures will be held in English, but some supporting material and explanations are also given in Japanese. Students are welcome to ask questions in English or Japanese during and after the class. Office hours are flexible. Appointments can be made directly or via email.

[主要授業科目（学部・学科名）]

理学部