Name: ***Physical adsorption on solid surfaces - theoretical bases and applications (C-PS.II1-PhysAds)***
Name in Polish:
Name in English: ***Physical adsorption on solid surfaces - theoretical bases and applications***

Information on course:

Course offered by department: Faculty of Chemistry
Course for department: Faculty of Chemistry

Default type of course examination report:

Grading

Language:

English

Description:

Introduction with the historical aspects. The adsorption on heterogeneous surfaces; adsorption of individual components, gas and liquid mixtures. The fractal theory of the adsorption. Elements of kinetics of the adsorption process. Bases of molecular modeling of adsorption processes. Adsorbents – division, preparation methods, and their characteristic. Chosen examples of the adsorption processes applications in the: industry, environmental protection. Short review of the literature connected with the lecture content.

Bibliography:

1, J. Ościk, Adsorption, Ellis Horwood, Chichester, PWN, Warszawa, 1975.
2. M. Jaroniec, R. Madey, Physical adsorption on heterogeneous solids, Elsevier, Amsterdam, 1988.
3. A. Dąbrowski, M. Jaroniec, Adv. Colloid Interface Sci., 27 (1987) 211.
4. A. Dąbrowski, M. Jaroniec, Adv. Colloid Interface Sci., 31 (1990) 155.
5. A. Dąbrowski, Adsorption – from theory to practice, Adv. Colloid Interface Sci., 93 (2001) 135.
6. A. Dąbrowski (Ed.), Adsorption and its applications in industry and environmental protection, Vol. 120A and 120B, Elsevier, Amsterdam, 1999.
7. R.T. Yang, Adsorbents. Fundamentals and applications, Wiley-Interscience, New Jersey, 2003.

Learning outcomes:

KNOWLEDGE
K_W01 Student has the extended knowledge on the physical adsorption on solid surfaces.
K_W02 Student knows the thermodynamical description of the adsorption of gases, their mixtures and liquid solutions on homogeneous and heterogeneous solid surfaces.
K_W03 Student has the indispensable knowledge about the kinetics of adsorption and the molecular modeling of adsorption processes.
K_W04 Students knows the examples of the practical applications of the adsorption, both in the industry and in the environmental protection.

SKILLS
K_U01 Student can to describe the pioneering experimental and theoretical ages of adsorption.
K_U02 Student can to use the most important equations of adsorption isotherms for practical purposes.
K_U03 Student can to describe the new types of solid adsorbents used in the laboratory and industrial applications.
K_U04 Student can to use the up-to-date terminology in the adsorption science.
ATTITUDES
K_K01 Student understands some restrictions of own knowledge on the adsorption, has the inclination for studying the new theoretical and practical approaches on the surface science.
K_K02 Student studies separately the contemporary literature on the subject matter, and is able to seek the essential information on it in the text books, review articles and the internet.
K_K03 Student is conscious of the role of the adsorption and related surface phenomena in the industrial and environmental applications.

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Contact hours (work with an academic teacher) 15

Total number of hours with an academic teacher 15

Number of ECTS points with an academic teacher 0.5

Non-contact hours (students' own work) 15

Total number of non-contact hours 15

Number of ECTS points for non-contact hours 0.5

Total number of ECTS points for the module 1

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Credit or exam

Requirements

The average advanced level of English language; passed exams: physical chemistry and statistical thermodynamics.

Course credits in various terms:

<without a specific program>

Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	1	15/16	