

Course description

Course abbreviation:	KCH/LCTEX	Page:	1 / 3
Course name:	Practical Laboratory Work - Texture of S		
Academic Year:	2016/2017	Printed:	25.09.2017 22:37

Department/Unit /	KCH / LCTEX	Academic Year	2016/2017
Title	Practical Laboratory Work - Texture of S	Type of completion	Pre-Exam Credit
Long Title	Practical Laboratory Work - Texture of Solid Substances		
Accredited/Credits	Yes, 5 Cred.	Type of completion	Oral
Number of hours	Cvičení 3 [Hours/Week]		
Occ/max	Status A	Status B	Status C
Summer semester	0 / -	0 / -	0 / -
Winter semester	4 / -	0 / -	0 / 0
Timetable	Yes		
Language of instruction	Czech		
Substituted course	None		
Preclusive courses	N/A		
Prerequisite	N/A		
Informally recommended courses	N/A		
Courses depending on this Course	N/A		

Course objectives:

Aims

The students practically familiarize with the experimental procedures for quantification of the texture parameters of solids. In the laboratory practice, they measure the adsorption isotherms under the static conditions (Sorptomatic) and under the dynamic conditions (by means of gas chromatography). They practically perform measurement of volume and macropores and mesopores distribution by means of mercury porosimetry, they measure wetting and adsorption heats, and they determine isosteric adsorption heats by means of gas chromatography.

Requirements on student

Requirements

Achieving the required value of minimum point evaluation - 75% of the total points.

Evaluation of the subject as well as the exam grading is made according to the articles No 31 - 33 in the Regulations on Study and Examinations University of Ostrava

Content

Content

1. week: 3 hours, safety of labour, assignment of the laboratory works

2. - 13. week: The works in six-hour blocs biweekly

The works choice:

3. week: Determination of the nitrogen adsorption isotherms at -196°C with use of the instrument Sorptomatic 1800 Carlo Erba;
5. week: Determination of volume and distribution of macro- and mesopores with use of the instrument Porosimeter 2000 (Carlo Erba);

7. week: Determination of the internal surface area by means the dynamic (chromatographic) methods (one-point isotherm)

9. week: Determination of the total volume of the solids pores from difference of apparent and real density.

11. week: Determination of the water wetting heat of solids with hydrophilic and hydrophobic surface (calorimeter C80, Setaram).

13. week: Determination of zeta potential and distribution of particles according to size of the dispersed systems (Delsa 440SX, Beckman Coulter). The course final evaluation, awarding the credits.

Prerequisites - other information about course preconditions

none

Competences acquired

Competences

The students deepen their laboratory skills and habits of the correct laboratory practice at the physicochemical measurements for study of the texture-structure properties of solids. The students deepen their skills by means of working-out the laboratory reports, too. In order to prepare for the laboratory practices the students integrate their knowledge from the field of the solids texture and they can apply them in the laboratory examination.

Studijní opory**Guarantors and lecturers**

- **Guarantors:** prof. Ing. Boleslav Taraba, CSc.
- **Tutorial lecturer:** Mgr. Tomáš Zelenka, Ph.D.

Literature

- **Basic:** Ponec,V., Knor,Z., Černý,S. *Adsorpce na tuhých látkách, Praha SNTL, 1968..*
- **Recommended:** M.M.Dubinin a kol. *Adsorpcia v mikroporach, Izd. Nauka, 1983, Moskva..*
- **Recommended:** Gregg,S.J., Sing,K.S.W. *Adsorption, Surface Area and Porosity (2nd edition), Academic Press, London, 1982..*

Time requirements

Activities	Time requirements for activity [h]
Being present in classes	39
Unaided e-learning tasks completion	52
Self-tutoring	34
Total:	125

assessment methods**professional knowledge**

Continuous analysis of student´s achievements

prerequisite**professional knowledge**

none

teaching methods**professional knowledge**

Kinetic and practical skills training

Working with text (coursebook, book)

learning outcomes**professional knowledge**

Competences

The students deepen their laboratory skills and habits of the correct laboratory practice at the physicochemical measurements for study of the texture-structure properties of solids. The students deepen their skills by means of working-out the laboratory reports, too. In order to prepare for the laboratory practices the students integrate their knowledge from the field of the solids texture and they can apply them in the laboratory examination.

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Chemistry	Postgraduate Master	Full-time	Analytical Chemistry of Solid Phase	1	2013	2016	Povinné předměty	A	2	ZS
Chemistry	Postgraduate Master	Full-time	Teaching for Secondary Schools - Single-Specialization Chemistry	1	2	2016	Povinně volitelné předměty	B	1	ZS