

Information sheet for the course Colloid and Surface Chemistry

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>VILA – Joint Glass Centre</i>	
Course unit code: <i>CSCH</i>	Course unit title: <i>Colloid and Surface Chemistry</i>
Type of course unit: <i>compulsory</i>	
Planned types, learning activities and teaching methods: <i>Lecture: 4 hours weekly/52 hours per semester of study; face to face</i>	
Number of credits: <i>10</i>	
Recommended semester: <i>1. semester in the 1st year (full-time)</i> <i>1. semester in the 1st year (full-time)</i>	
Degree of study: <i>III. (PhD)</i>	
Course prerequisites: <i>none</i>	
Assesment methods: <i>A requirement to complete the subject is the successful passing the examination. The examination is in the form of test that consists of 20 questions (in total 100 points). Gradings: Final letter grades will be assigned according to the following total points earned: A 95-100 points, B 90-95 points, C 80-90 points, D 70-80 points, E at least 60 points.</i>	
Learning outcomes of the course unit: <i>A student will receive the integral set of basic knowledge in the field of colloid and surface chemistry. The student will be able to understand the principles of physico-chemical phenomena, relations between structure and properties in the field of colloid and surface chemistry, and to apply the received knowledge in modern technology, nanotechnology and environmental protection.</i>	
Course contents: <ol style="list-style-type: none"> 1. <i>Introduction to colloid and surface chemistry. Basic definitions and terms used in colloid and surface chemistry.</i> 2. <i>Surface phenomena and the structure of the interface.</i> 3. <i>Adsorption at the liquidus-gaseus interfaces. Adsorption isotherms.</i> 4. <i>Surface active and inactive agents. Adsorption at the solid interfaces. Adsorption at the condensed interfaces.</i> 5. <i>Molecular and kinetics properties of dispersions – Brownian motion, diffusion.</i> 6. <i>Sedimentation in dispersion systems and sedimentation methods in analysis of dispersions.</i> 7. <i>Sedimentation-diffusion equilibrium in dispersion systems.</i> 8. <i>Thermodynamics of solutions, osmotic pressure and the theory of membrane equilibrium.</i> 9. <i>Rheological properties of dispersion systems – viscosity.</i> 10. <i>Optical properties of dispersion systems – light scattering.</i> 11. <i>Electrical properties of dispersion systems – electrical double layer, electrokinetics phenomena, electrocapillary phenomena.</i> 12. <i>Lyophilic colloidal systems. Lyophobic colloidal systems.</i> 13. <i>Gels.</i> 14. <i>Chemical functionalization of surfaces – importance and applications.</i> 	
Recommended of required reading: <i>E.D.Ščukin, A.V.Percov, E.A.Amelinová: Koloidní chemie, Academia, Praha 1990.</i> <i>L. Bartovská, M. Šišková, Fyzikální chemie povrchů a koloidních soustav, 5. vydání VŠCHT Praha, 2005.</i> <i>J. Pouchlý, Fyzikální chemie makromolekulárních a koloidních soustav, 3. vydání, VŠCHT Praha, 2008.</i>	

P.W. Atkins: Fyzikálna Chémia, STU Bratislava, 1999.

P.C. Hiemenz, R. Rajagopalan: Principles of Colloid and Surface Chemistry. 3rd Ed., Marcel Dekker, Inc., New York, 1997.

Language: *Slovak*

Remarks: *none*

Evaluation history:

A	B	C	D	E	FX

Lecturer: *Ing. Róbert Klement, PhD.*

Last modification: *31. 1. 2014*

Supervisor: *prof. Ing. Marek Liška, DrSc.*