

PHD STUDIES COURSE UNIT DESCRIPTION

| Name of subject | Field of science, code | Faculty / Center | Department |
|--------------------|------------------------|--------------------------------------|--------------------|
| Adsorption | Chemistry N 003 | Faculty of Chemistry and Geosciences | Physical chemistry |
| Student's workload | Credits | Student's workload | Credits |
| Lectures | | Consultations | |
| Independent study | 10 | Seminars | |

Course annotation

Importance of adsorption and diffusion during the evaluation of chemical reactions.
 General principles of adsorption processes.
 Classification of adsorption processes.
 Models and mechanisms of adsorption processes.
 Adsorption of homogenous and heterogenic surfaces.
 The influence of temperature on adsorption process.
 The influence of solvents on adsorption processes.
 Experimental methods used for the evaluation of adsorption mechanisms and modelling of adsorption process.

Reading list

- Atkins P., Paula J. Physical Chemistry for the Life Sciences Oxford University Press, 2006
- L.Gorton (Ed.), Biosensors and modern biospecific analytical techniques, in: Comprehensive Analytical Chemistry, vol. 44. Elsevier, 2007, 635 p.
- E.T.Denisov et al., Chemical kinetics. Fundamentals and new developments. Elsevier, 2003.

| The names of consulting teachers | Science degree | Main scientific works published in a scientific field in last 5 year period |
|----------------------------------|----------------|---|
| Arūnas Ramanavičius | Habil.dr. | <p>I. Plikusiene, V. Maciulis, O. Graniel, M. Bechelany, S. Balevicius, V. Vertelis, Z. Balevicius, A. Popov, A. Ramanavicius, A. Ramanaviciene. Total internal reflection ellipsometry for kinetics-based assessment of bovine serum albumin immobilization on ZnO nanowires. Journal of Materials Chemistry C 2021, 9, 1345-1352.</p> <p>I. Plikusiene, V. Maciulis, A. Ramanaviciene, Z. Balevicius, E. Buzavaite-Verteliene, E. Ciplys, R. Slibinskas, M. Simanavicius, A. Zvirbliene, A. Ramanavicius. Evaluation of Kinetics and Thermodynamics of Interaction between Immobilized SARS-CoV-2 Nucleoprotein and Specific Antibodies by Total Internal Reflection Ellipsometry. Journal of Colloid and Interface Science. 2021, 594, 195–203.</p> <p>I. Plikusiene, Z. Balevicius, A. Ramanaviciene, J. Talbot, G. Mickiene, S. Balevicius, A. Stirke, A. Tereshchenko, L. Tamosaitis, G. Zvirblis, A. Ramanavicius. Evaluation of affinity sensor response kinetics towards dimeric ligands linked with spacers of different rigidity: immobilized recombinant granulocyte colony-stimulating factor based synthetic receptor binding with genetically engineered dimeric analyte derivatives. Biosensors and Bioelectronics 2020, 156, 112112.</p> |

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| | | <p>S. Ramanavicius, A. Jagminas, A. Ramanavicius, Advances in molecularly imprinted polymers based affinity sensors (Review). <i>Polymers</i> 2021, 13, 974.</p> <p>Z. Balevicius, J. Talbot, L. Tamosaitis, I. Plikusiene, A. Stirke, G. Mickiene, S. Balevicius, A. Paulauskas, A. Ramanavicius. Modelling of immunosensor response: the evaluation of binding kinetics between an immobilized receptor and structurally-different genetically engineered ligands. <i>Sensors and Actuators B Chemical</i> 2019, 297, 126770.</p> |
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Certified during Doctoral Committee session on September 28th, 2021. Protocol No. 610000-KT-142.

Committee Chairman prof. habil. dr. Aivaras Kareiva