|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1. Course title: General and Inorganic Chemistry IV | | | | | |
|  | | | | |
| 2. Code: | | 3. Type (lecture, practice etc.): lecture | | | |
|  | | | | |
| 4. Contact hours: 2 hoursper week | | 5. Number of credits (ECTS): 3 | | | |
|  | | | | |
| 6. Preliminary conditions (max. 3):  General and Inorganic Chemistry III. | | | | | |
|  | | | | |
| 7. Announced:fall semester, xspring semester, both | | | | | |
|  | | | | |
| 8. Limit for participants: 150 | | | | | |
|  | | | | |
| 10. Responsible teacher (faculty, institute and department):  László Kollár DSc (Faculty of Science, Institute of Chemistry, Department of Inorganic Chemistry) | | | | | |
|  | | | | |
| 11. Teacher(s) and percentage: | | László Kollár | | 100% | |
|  | |  | |
|  | |  | |
|  | |  | |
|  | |  | |
|  | | | | |
| 12. Language:English | | | | | |
|  | | | | |
| 13. Course objectives and/or learning outcomes:  Objectives: The lecture intends to introduce students to coordination chemistry of main group and d-block elements. Based on the previous studies on coordination chemistry thought in inorganic chemistry courses, a systematic overview is given regarding the group of elements and ligands. Selected examples are shown about the use of transition metal complexes of practical importance used in homogeneous catalysis.  Learning outcomes: Students completing the course will have *knowledge* on major groups of simple coordination compounds without direct metal–carbon bond. They will be *able* arrange and classify complexes regarding their coordination numbers, charges and geometries. They will have a *competence* of evaluating literature in coordination chemistry. The positive *attitude* of students towards the application of complexes will increase significantly. | | | | | |
|  | | | | |
| 14. Course outline  The basics of coordination chemistry (coordinative bond, coordination number, stability constants). Bonding theories describing complexes (VB-theory, crystal-field theory, ligand-field theory).  Early steps in coordination chemistry (19th century): discoveries of Zeise, Peyrone, Cossa, Werner, etc.  The coordination chemistry of main group elements I (alkali metals)  The coordination chemistry of main group elements II (alkaline earth metals)  The coordination chemistry of main group elements III (boron and aluminium)  The coordination chemistry of main group elements IV (tin and lead)  Transition metal complexes I (group of Ti and V)  Transition metal complexes II (group of Cr and Mn)  Transition metal complexes III (group of Fe, Co, Ni)  Transition metal complexes IV (Ru, Rh, Pd triad)  Transition metal complexes V (Os, Ir, Pt triad)  Transition metal complexes VI (group of Cu)  Transition metal complexes VII (group of Zn)  Transition metals as homogeneous catalysts (an outlook); elementary reactions in the coordination sphere of a transition metal.  Week 13  Transition metals as homogeneous catalysts (an outlook); elementary reactions in the coordination sphere of a transition metal. | | | | | |
|  | | | | |
| 15. Mid-semester works  Attending lectures is highly recommended. | | | | | |
|  | | | | |
| 16. Course requirements and grading  Written exam is based on lectures, accessible electronic sources and lecture materials. Most common questions in the structure of end term examination are: describing notions, relations, recognizing figures, analysis, multiple choice questions.  Grades:  0–50% fail  51–65% acceptable  66–75% average  76–90% good  91–100% excellent | | | | | |
|  | | | | |
| 17. List of readings   1. N.N. Greenwood – A. Earnshaw: Chemistry of the Elements. Butterworth-Heinemann, Oxford, 1997. | | | | | |
|  | | | | |
| 18. Recommended texts, further readings   1. An electronic textbook is available from the lecturer. | | | | | |
|  | | | | |
| **Date** | 13 April, 2017 | **Prepared by** |  | | |
| Dr. László KOLLÁR  responsible teacher | | |
|  | | | | |
| **Endorsed by** | | |  | | |
| Dr. László KOLLÁR program supervisor | | |