



Univerza v Mariboru

Fakulteta za kemijo
in kemijsko tehnologijo

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Ime predmeta:	Anorganska kemija
Course title:	Inorganic chemistry

Študijski program in stopnja Study programme and cycle	Študijska smer Study option	Letnik Year of study	Semester Semester
Predmetni učitelj, usmeritev Izobraževalna kemija, enovit magistrski študij		1.	2.
Subject Teacher, the major subject Educational Chemistry, Uniform master's studies		1 st	2 nd

Vrsta predmeta (obvezni ali izbirni) /
Course type (compulsory or elective)

Obvezni

Compulsory

Univerzitetna koda predmeta / University course code:

Predavanja Lectures	Seminar Seminar	Vaje Tutorial	Klinične vaje Clinical training	Druge oblike študija Other forms of study	Samost. delo Individual work	ECTS
45		AV 15	LV RV		60	4

Nosilec predmeta / Course coordinator:

IRENA BAN

Jeziki /Languages:

Predavanja / Lectures: Slovenski /Slovene

Vaje / Tutorial: Slovenski /Slovene

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Ni pogojev za vključitev v delo.

Prerequisites for enrolling in the course or for performing study obligations:

There are no prerequisites to enter the course.

Vsebina (kratek pregled učnega načrta):

Predmet zajema osnove anorganske kemije. Periodni sistem kot osnova sistematike elementov in anorganskih spojin:

- Vodik, kisik in njune spojine-reprezentativni elementi
- 18. skupina PS - Žlahtni plini
- 17. skupina PS - Halogeni
- 16. skupina PS - Halkogeni
- 15. skupina PS
- 14. skupina PS

Content (syllabus outline):

The course covers the basics of inorganic chemistry. Periodic table as a basis of systematics of elements and inorganic compounds:

- Hydrogen, oxygen and their compounds-representative elements
- Group 18 of the PT – The Noble gases
- Group 17 of the PT – The Halogens
- Group 16 of the PT – The Chalcogens
- Group 15 of the PT - The Pnictogens

• 13. skupina PS • 2. skupina PS – zemljoalkalijske kovine • 1. skupina PS – alkalijske kovine • Kemija elementov prehoda (d-blok). Pregled in lastnosti prve vrste kovin prehoda. Pregled in lastnosti druge in tretje vrste kovin prehoda. • Kemija lantanoidov in aktinoidov (f-blok) • Jedrske reakcije • Kemija koordinacijskih spojin	• Group 14 of the PT • Group 13 of the PT • •Group 1 of the PT– The alkaline earth metals • • Group 2 of the PT – The alkali metals • Chemistry of transition elements (d-block). Overview and properties of the first row of transition metals. Overview and properties of the second and third rows of transition metals. • Chemistry of lanthanides and actinides (f-block) • Nuclear reactions • Chemistry of coordination compounds
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Temeljni literatura in viri / Reading materials:

- D. F. Shriver, P. W. Atkins: *Inorganic Chemistry*, Oxford-University Press, 5th Ed (2010)
- F. Lazarini in J. Brenčič, Splošna in Anorganska kemija, Založba FKKT, Ljubljana (2011)

Dodatna priporočena literatura:

- M. Drofenik, Splošna in anorganska kemija, Fakulteta za kemijo in kemijsko tehnologijo – Univerza v Mariboru (2013)
- N. N. Greenwood, A. Earnshaw, Chemistry of the Elements, Second Edition Paperback – Elsevier Butterworth-Heinemann, 2009

Cilji in kompetence:

Študent bo razumel osnovne lastnosti reprezentativnih elementov periodnega sistema. Periodni sistem elementov je študentu osnova razumevanja in ureditev velikega števila kemijskih zakonitosti v obvladljivo shemo. Znanje mu bo pomagalo pri aktivni vključitvi v problematiko s področja anorganske kemije pri aktivni vključitvi v nadaljni študij po programu Predmetni učitelj – Izobraževalna kemija.

Objectives and competences:

The student will understand the basic properties of representative elements of the periodic table. The periodic table of elements is the student's basis for understanding and arranging a large number of chemical laws into a manageable scheme. The knowledge will help him/her to be actively involved in the field of inorganic chemistry and to be actively involved in further studies under the Subject Teacher – Educational Chemistry program.

Predvideni študijski rezultati:

Intended learning outcomes:

Znanje in razumevanje: • Študent je sposoben navesti osnovne značilnosti kemije elementov glavnih in stranskih skupin • Zna naštet in razložiti osnovne kemijske zakonitosti, ki vplivajo na periodične lastnosti elementov in njihovih spojin. • Zna opisati strukturne značilnosti, reaktivnost kemijskih spojin, pomembne kemijske reakcije ter uporabiti nomenklaturu anorganskih spojin. • Študent zna razložiti razvrščanje nekaterih kovin in polkovin kot kritičnih zaradi geoloških ovir, geopolitičnih in/ali ekonomskih dejavnikov. • Razume biodostopnost in toksičnost kovin v okolju. • Študent bo sposoben oceniti pomen osnovnih kemijskih zakonitosti in teoretskega znanja, in lastnosti za razlago eksperimentalnih dejstev. • Študent zna poiskati podatke iz strokovne literature, podatke iz virov medmrežja zna kritično oceniti. Uporabljati zna strokovni jezik (pisno in ustno). Prenesljive/ključne spretnosti in drugi atributi: Pridobitev kemijskih znanj potrebnih za razumevanje ostalih kemijskih predmetov (organska, analizna in fizikalna kemija) Pridobitev splošnega kemijskega znanja za sodelovanje pri ostalih tehnoloških in naravoslovnih predmetih po programu Predmetni učitelj – Izobraževalna kemija.	Knowledge and understanding: • The student is able to state basic chemical characteristics of the main transition group elements in the periodic table • He/She is able to list and explain the basic chemical principles that have an impact on the periodic properties of elements and compounds. • The student is able to describe structural features, reactivity of inorganic compounds, important chemical reactions and is able to use the nomenclature of inorganic compounds. • The student is able to explain the classification of some metals and metalloids as critical due to geological abundance, geopolitical and/or economic factors. • He/she Understands bioavailability and toxicity of metals in the environment. • The student is able to assess the meaning of basic chemical laws and theoretic knowledge in explaining experimental facts. • Student is able to find data from professional literature and is able to critically evaluate the data from the internet. He/She is able to use professional language (written and spoken). Transferable/Key Skills and other attributes: Acquisition of chemical knowledge necessary for understanding other chemical subjects (organic, analytical and physical chemistry). Acquisition of general chemical knowledge for participation in other technological subjects and natural science subjects in the Subject Teacher – Educational Chemistry program.
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Metode poučevanja in učenja:

Learning and teaching methods:

• Predavanja • Seminarske vaje	• Lectures • Seminar exercises
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Načini ocenjevanja:
Delež/Share (%)
Assessment methods:

• pisni izpit	100%	• written exam.
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Opombe:

Pisni izpit se lahko nadomesti tudi z dvema delnima testoma.

Comments:

The written exam can be replaced by two midterm exams.

Reference nosilca / Course coordinator's references:

1. PLOHL, Olivija, FRAS ZEMLIČ, Lidija, VIHAR, Boštjan, VESEL, Alenka, GYERGYEK, Sašo, MAVER, Uroš, BAN, Irena, BRAČIČ, Matej. Novel magnetic iron oxide-dextran sulphate nanocomposites as potential anticoagulants: Investigating interactions with blood components and assessing cytotoxicity. *Carbohydrate polymers*. Nov. 2024, vol. 343, [article no.] 122469, 13 str. ISSN 1879-1344. [Digitalna knjižnica Univerze v Mariboru – DKUM](#), DOI: [10.1016/j.carbpol.2024.122469](#). [COBISS.SI-ID [202837507](#)]
2. KRISTL, Matjaž, OSTROŠKO, Urška, BAN, Irena, PETRINIĆ, Irena, STERGAR, Janja. Thermal study of APTES-functionalized magnetite nanoparticles with citric acid and polyacrylic acid for advanced forward osmosis systems. *Journal of thermal analysis and calorimetry*. [Online ed.]. Published: 15 March 2024, 15 str., ilustr. ISSN 1588-2926. [Digitalna knjižnica Univerze v Mariboru – DKUM](#), DOI: [10.1007/s10973-024-12983-2](#). [COBISS.SI-ID [189345283](#)]
3. BAN, Irena, DROFENIK, Mihael, BUKŠEK, Hermina, PETRINIĆ, Irena, HÉLIX-NIELSEN, Claus, VOHL, Sabina, GYERGYEK, Sašo, STERGAR, Janja. Synthesis of magnetic nanoparticles with covalently bonded polyacrylic acid for use as forward osmosis draw agents. *Environmental science. Water research & technology*. 2023, vol. 9, str. 442-453, ilustr. ISSN 2053-1419. [Digitalna knjižnica Univerze v Mariboru – DKUM](#), DOI: [10.1039/D2EW00539E](#). [COBISS.SI-ID [132088835](#)]
4. VOHL, Sabina, BAN, Irena, DROFENIK, Mihael, BUKŠEK, Hermina, GYERGYEK, Sašo, PETRINIĆ, Irena, HÉLIX-NIELSEN, Claus, STERGAR, Janja. Microwave Synthesis of Poly(Acrylic) Acid-Coated Magnetic Nanoparticles as Draw Solutes in Forward Osmosis. *Materials*. 2023, vol. 16, iss. 11, [article no.] 4138, 15 str. ISSN 1996-1944. [Digitalna knjižnica Univerze v Mariboru – DKUM](#), DOI: [10.3390/ma16114138](#). [COBISS.SI-ID [154963715](#)]
5. KRAMER, Stanko, STERGAR, Janja, BAN, Irena, IMPERL, Jernej, KOLAR, Mitja, KRAJNC, Peter. Magnetic open porous microspheres via high internal phase emulsion templating as efficient Pb adsorption material. *Reactive and functional polymers*. Nov. 2023, [article no.] 105724, 9 str. ISSN 1873-166X. DOI: [10.1016/j.reactfunctpolym.2023.105724](#). [COBISS.SI-ID [164978691](#)]

