ONE SEMESTER LEARNING PLAN (RPSS)

INORGANIC CHEMISTRY LABORATORY (CHEM 213 2(0-6))

Prepared:
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DEPARTMENT OF CHEMISTRY
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
BOGOR AGRICULTURAL UNIVERSITY
2020

SYLABUS

Lecture / Code	:	Inorganic Chemistry Laboratory Course /CHEM 213
Semester / credits	:	Genap 2(0-6)
Description of Courses	:	This inorganic chemistry laboratory course is a compulsory subject of the Department of Chemistry. This course provides basic principles of Inorganic Chemistry in the form of practicum. The material of this practicum is related to symmetry and molecular orbitals; element; electrochemistry; synthesis, characterization, and application of inorganic compounds.
Prerequisite Courses	:	-
Learning Outcome	:	1. Able to use molecular models and chemical software such as AVOGADRO for the determination of symmetry elements, and group points of a simple compound 2. Able to use chemical software such as OCRA, AVOGARDO, and OPEN MPI to calculate orbital energy from simple atoms and compounds and explain chemical bonds that occur based on molecular orbital theory 3. Able to produce gas elements such as hydrogen gas, oxygen gas with small-scale chemical reactions and identify the gases produced by the synthesis. 4. Able to synthesize simple inorganic compounds namely alum and sodium silica and be able to characterize these compounds 5. Able to synthesize calcium phosphate compounds, namely hydroxy apatite (HAP) and tricalcium phosphate from natural phosphate sources such as egg shells and so on 6. Able to measure anticorrosive activity of inorganic compounds using methods of weight loss and potentiometry 7. Able to synthesize and characterize light-emitting inorganic materials such as carbon nanoparticles and copper cluster compounds. 8. Able to synthesize and characterize fertilizer compounds from mineral rocks 9. Able to synthesize and characterize the synthesis of coordination compounds: chromium (II) acetate hydrate, hexamine cobalt chloride, pentaamina cobalt chloride
Divisi/Bidang Ilmu	:	Inorganic chemistry
Dosen	:	1. Dr. rer. nat. Noviyan Darmawan MSc 2. Sri Sugiarti PhD 3. Dr. Charlena MS

		4. Dr. Tety Kemala MS

Rencana Pembelajaran Satu Semester (RPSS) Kuliah:

Week-	Learning Otcome	Subject	Teaching Method	Assesment	Percentage (%)
1	**2**	**3**	**4**	**5**	**6**
1	Able to follow the practicum well in accordance with the rules and regulations	Introduction	Lecture, interactive discussion	-	
2	Able to use molecular models and chemical software such as AVOGADRO for the determination of symmetry elements, and group points of a simple compound	Simetri, point group	Practical work	1. Able to use molecular models 2. Able to use AVOGADRO software 3. Able to identify symmetry elements in molecules **4.** Able to determine group points	
3	Able to use chemical software such as OCRA, AVOGARDO, and OPEN MPI to calculate orbital energy from simple atoms and compounds and explain the chemical bonds that occur based on molecular orbital theory	molecular orbital	Practical work	1. Able to create OCRA input files using AVOGARDO 2. Able to use OCRA to calculate molecular orbitals 3. Able to determine the optimum radius of the molecule 4. Able to make orbital diagrams according to calculation results	
5	Able to produce gaseous elements such as hydrogen gas, oxygen gas	Gas elements	Practical work	1. Performing reaction to synthesis hydrogen gas	

	with small-scale chemical reactions and identify the synthesis gases			from the reaction between zinc and acidic solutions 2. Forming oxygen gas by heating potassium chlorate with a catalyst in the form of manganese oxide (MnO2) 3. Production of chlorine gas formation (Cl2), among others, can be obtained from the reaction of Ca (ClO)2 (chlorine) with acid (HCl)	
6a	Able to synthesize simple inorganic compounds namely alum and sodium silica and be able to characterize these compounds	Synthesis of simple inorganic compounds	Practical work	1. Conduct synthesis of alum compounds from aluminum used soft drink cans 2. Grow single crystal alum with recrystallization method and add crystal seed 3. Synthesis of sodium silica compounds from rice husks	
6b	Able to synthesize calcium phosphate compounds, namely hydroxy apatite (HAP) and tricalcium phosphate from natural phosphate sources such as egg shells and so on	Synthesis of simple inorganic compounds	Practical work	1. Perform HAP synthesis 2. Perform sodium silicate synthesis 3. Determine calcium levels	
7	**Review dan presentation**				
UTS					

8 and 9	Able to measure anticorrosive activity of inorganic compounds using methods of weight loss and potentiometry	Electrochemistry	Practical work	1. measure anticorrosive activity with weight loss method 2. measure anticorrosive activity with potentiometric methods 3. Measuring optimum concentration for corrosion inhibition	
9 and 10	Able to synthesize and characterize light-emitting inorganic materials such as carbon nanoparticles and copper cluster compounds.	Nanoparticles, cluster compounds and luminous materials	Practical work	1. Synthesize carbon nanoparticles by microwave method 2. Synthesize pyridine CuI cluster compounds 3. To characterize the photophysical properties of synthesized fluorescent fluorescent compounds.	
11 and 12	Able to synthesize and characterize fertilizer compounds from mineral rocks	Synthesis of simple inorganic compounds	Practical work	1. Synthesis of MAP and DAP fertilizer compounds from calcium phosphate 2. Test phosphate levels	
12 dan 13	Able to synthesize and characterize the synthesis of coordination compounds: chromium (II) acetate hydrate, hexamine cobalt chloride, pentaamina cobalt chloride	Coordination compounds	Practical work	1. Synthesizing chromium (II) acetate hydrate compounds 2. Synthesize hexamine cobalt chloride compounds 3. Synthesizing pentaamine cobalt chloride compounds	
14	**Review and presentation**				

UAS

Rancangan Penilaian:

	Capaian pembelajaran	Ujian	
		Ujian UTS	Ujian UAS
1.	Able to follow the practicum well in accordance with the rules and regulations	√	
2.	Able to use molecular models and chemical software such as AVOGADRO for the determination of symmetry elements, and group points of a simple compound	√	
3.	Able to use chemical software such as OCRA, AVOGARDO, and OPEN MPI to calculate orbital energy from simple atoms and compounds and explain the chemical bonds that occur based on molecular orbital theory	√	
4.	Able to produce gaseous elements such as hydrogen gas, oxygen gas with small-scale chemical reactions and identify the synthesis gases	√	
5.	Able to synthesize simple inorganic compounds namely alum and sodium	√	

	silica and be able to characterize these compounds		
6.	Able to synthesize calcium phosphate compounds, namely hydroxy apatite (HAP) and tricalcium phosphate from natural phosphate sources such as egg shells and so on		√
7.	**Review dan presentation**		√
8.	**UTS**		√
9.	Able to measure anticorrosive activity of inorganic compounds using methods of weight loss and potentiometry		√
10.	Able to synthesize and characterize light-emitting inorganic materials such as carbon nanoparticles and copper cluster compounds.		
11.	Able to synthesize and characterize fertilizer compounds from mineral rocks		
12.	Able to synthesize and characterize the synthesis of coordination compounds: chromium (II) acetate hydrate, hexamine cobalt chloride, pentaamina cobalt chloride		

Assessment:

Assessment criteria	range	percentage (%)	note
Practicum Assessment:			
Job Assessment	0-100	20	Individual
Working meeting evaluation	0-100	10	Individual
Report Assessment	0-100	15	Individual
Presentation assessment	0-100	15	Group
UTS	0-100	25	Individual
UAS	0-100	25	Individual
Total		**110**	

Reference:

1. **Darmawan N, Sugiarti, S. 2020. Penuntun Praktikum Kimia AnOrganik. Modul.**