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**Department of ……Chemistry….**

**College of ……Education…**

**University of ……Salahaddine……**

**Subject: ……Th. Inorganic Chemistry- Representative and Lanthanide Elements**

**Course Book – *Stage* 2 –Second Semester**

**Lecturer's name – Assist.Prof.Kamaran Basheer MSc**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | **Inorganic** | |
| **2. Lecturer in charge** | **Kamaran Basheer** | |
| **3. Department/ College** | **Chemistry / education** | |
| **4. Contact** | **e-mail:** [**kamaran.hussein@su.edu.krd**](mailto:kamaran.hussein@su.edu.krd)  **Tel: (optional)** | |
| **5. Time (in hours) per week** | **Theory: 4** | |
| **6. Office hours** | **Monday10-11.5 or by appointment** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | **Name : Kameran Basheer Hussein**  **Permanent Address /**  Chemistry Department, Faculty of Education – Science Departments, University of Salahaddin , Erbil, Iraq  Tel: +9642516418  Mobil: + 9644771323  E-mail: [kamaran1963@gmail.com](mailto:kamaran1963@gmail.com) [Kamaran.1963@yahoo.com](mailto:Kamaran.1963@yahoo.com)  Nationality: Iraqi  Date of Birth: 19 April 1963  Marital Status: Married, withv 3 children  **Education**  1987 : B.Sc. General Chemistry, College of Science ,University of Salahaddin, Erbil, Iraq  2003 : M.Sc Inorganic Chemistry, Title of Theses: Synthesis , Spectral and Thermal Studies of Some Rare Earth Metal Ion Complexes With PAN. University of Baghdad, College of Science , Baghdad , Iraq .  **Positions** **Held :**  2003-2016: Lecturer at Chemistry Department, College of Education University of Salahaddin, Erbil, Iraq.2000-2003: M.Sc. Student at the Baghdad University 1993-2000: Demonstrator, Chemistry Department, College of Education**/**science, University of Salahaddin, Erbil, Iraq .  **Teaching** **Experience**   * Theoretical Inorganic Chemistry, to 2nd year B.Sc. students Chemistry Department. * Practical Inorganic Chemistry, to 2nd year B.Sc. students. * Practical Inorganic Chemistry, to 3rd year B.Sc. students . * Practical General Chemistry, to 1st year B.Sc. students .   **Publications**  1-Synthesis and Biological activity studies of Some Vanadyl(IV) Complexes With Schiff base , Tikrit Journal of Pure Science , Vol.13, No. 2 ; (2008) .  2- Preparation and Characterization of Trivalent Lanthanide ion Complexes With Tridentate mono azo Ligand , Journal of Wassit for Science and Medicine , Vol. 1 , No. 2 ; August (2008).  3- Synthesis , Characterization and Biological Activity of Some Lanthanide Metal Complexes With Schiff base , 4th scientific conference , Wasst university , Wassit , Iraq ; (2010) .  4- Study of Temperature Effect on Reaction product of Some Lanthanide Metal Ions With Urea , Journal of Wassit for Science and Medicine , Vol.3 , No. 2 , August (2010).  5- Synthesis of Mixed Ligand Complexes of La(III) , Ce(III) ,Nd(III) & Eu(III) , Zanco Journal of Pure and Applied Science , Vol.22 , No.5 , (2010) .  6- Preparation and properties of Some Transition Metal Complexes With Schiff base , 5th  Scientific Conference , Wassit university , Wassit , Iraq ; (2011).  7- Kameran B. Hussein ; Liquid – Crystalline Lanthanide Complexes , highlight , 2012 .  8- Spectroscopic Studies of 3-(4-chlorophenylazo)- 4- hydroxyl acetophenone and Some of it's Metal Complexes, Journal of Wassit for Science and Medicine , (2013) .  9-Synthesis of some lanthanide complexes with (o-V2Nph.H2) Schiff-base ligand,polytechnic journal(2017).  10- Synthesis of some lanthanide complexes with TAR ligand.under work.2020.  11- Crystal and molecular structure of tris- acetylacetonate with La(III) metal ion complex(acceptde)  12- Mononuclear Erbium (III) Complexes with Tetradentate N2O2 Schiff Base Ligand(accepted)  13-Synthesis , Antibacterial Activity of Sm(III) Complex With L-phenylalanine  Kamaran Basheer Hussein(2022).  **Translation**:  1-English Translation of Experiments in preparation of Coordination Complexes for B.Sc. students 3rd year class .  2- English Translation of Experiments in preparation of inorganic salts for B.Sc. students 2nd year class .  **Conferences:**  1- 4th scientific conference , Wasst university , Wassit , Iraq ; (2010) . 2- 5th scientific conference , Wasst university , Wassit , Iraq ; (2011).  **Other activates:**  1- Member of different comities in the College .  2-Member of chemical society . | |
| **9. Keywords** | **Periodic table classification , uses and application** | |
| **10. Course overview:**  Studing the periodic table is very important because all branches of chemistry depend on the information about the elements in the periodic table and known the chemical and physical properties of their elements.Shows the background and the principles of all branches of chemistry.  Studenties must understanding the fundamental concepts of the course and they follow the topics of course book and studing the key words in detail . Theories and history of development of periodic table since more than 100years. The periodic table elements used in huge field in industry to proved our needs in daly life . Lecturer must combine the scientific subject with surrounding and our daly life and there application of these elements as compounds and elements , and their basic reactions and their effects on human life also their benefits .Graduate students with understanding principles of classification periodic table elements will enable them to be successful candidates for postgraduate studies and to work in research centers and ph armaceutical companies and a teacher in schools and universities . | | |
| **11. Course objective:**  **Classification is an important science process skill. In the interactive simulation, students will classify elements based on their physical and chemical properties. This process is part of a larger realm, which is the unifying concept of systems order and organization. According to *The National Science Education Standards,* “The natural and designed world is complex; it is too large and complicated to investigate and comprehend all at once. Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as 'systems'." The periodic table represents such a system. Systems can be organized into a way that is useful. The standards point out that the “Types of organization include the periodic table of elements and the classification of organisms. Physical systems can be described at different levels of organization-such as fundamental particles, atoms, and molecules.**  [**Dmitri Mendeleev**](http://chemistry.about.com/od/famouschemists/p/mendeleevbio.htm) **was the first scientist to create a periodic table of the elements similar to the one we use today. You can see** [**Mendeleev's original table**](http://chemistry.about.com/od/imagesclipartstructures/ig/Science-Pictures/Mendeleev-s-Periodic-Table.-0EA.htm) **(1869). This table showed that when the elements were ordered by increasing** [**atomic weight**](http://chemistry.about.com/library/glossary/bldef510.htm)**, a pattern appeared where properties of the elements repeated** [**periodically**](http://chemistry.about.com/od/periodictableelements/a/periodictrends.htm)**. This periodic table is a chart that groups the elements according to their similar properties The periodic table helps predict some properties of the elements compared to each other.** | | |
| **12. Student's obligation**  The role of students very important in learning process and they must participate in class activites such quations and answers lecturer should adivice students don't absence in the lectures because it reflect on them negativily . Home works are important such as writing report about scientific subjects or doing representation by datashow and seminers in class and evaluate the ability of their presentation and personality . The students should attend all the lectures, should pass the final exam and do all the tests and quizzes, should participate in discussion and question and answer activity . | | |
| **13. Forms of teaching**  Using the following means in teaching process .  Datashow and hand out , Tutorials , Discussions | | |
| **14. Assessment scheme**  Studentes assessment by doing at least ‌ 2 tests during the course and a number of quizzes and hom work . | | |
| **15. Student learning outcome:**  1-Explain the historical development of the periodic table elements , dobrener trid , newland octave , mendeelev 'speriodic law .  2-Chemical bonding , types of bonds in chemical compounds .  3-Studying the chemical and physical properties of all periodic elements .  4-Uses and application of their elements in periodic table .  5-Classification elements according modern periodic law .  6-Studying the chemical strture of peroxids hydrides and their chemical reaction . | | |
| **16. Course Reading List and References‌:**  1. N.N.Greenwood and A.Earnshaw **, Chemistry of the elements , 2nd Edition school of chemistry , university of Leeds , U.K.**  **2.Geoffraymer – Canham Tina Overton, Descriptive** Inorganic chemistry , 4th edition , New York , university of Hull .  3.Catherine E.House croft and Alan G.sharpe , Inorganic Chemistry , 1st edition 2001 , England .  4. Internet | | |
| **17. The Topics: 2nd course-2022-2023-(15weeks)** | | **Lecturer's name** |
| Week(1): Alkaline earth metals IIA , Occurrence , Manufactur , Alkaline earth compounds , Oxides and hydroxides , Halides , Complex ions in aqueous solution , Organometallic compounds .  Week(2): The group IIIA Elements  boron , Boron compounds , Boron- Nitrogen compound , Boron halides , Aluminium , Preparation and uses of the metals , Aluminium hydrides , Organo aluminium compounds , Organometallic compounds of Ga,In & Tl .  Week(3): The Group IVA Elements:  Allotropic forms of Carbon , graphite , diamond , Fullerenes , Chemistry of the fullerenes , Hydrogenation , Addition Reaction , Chemical properties of carbon .Week(4): Graphite intercalation compounds , Carbides , Oxides and Carbonates  Week(5); Production and uses of CO2 , Carbon-Nitrogen compounds cyanides , Production and Uses of CO2 .  Week(6): Silicon , Isolation , Production , industrial uses , Germanium , Tin & Lead .  Week(7): The Group VA Elements  Nitrogen , Chemical reactivity of nitrogen , Nitrides , azides and nitride , Hydrides of nitrogen , Oxides of nitrogen , Nitrous oxide , the oxides of Nitrogen .  Week(8): Phosphorus Chemistry , Abundance and distribution , Production of elemental phosphorus , Allotropes of phosphorus , (white , red and black phosphorus) ,  Week(9): Group- VIA- Oxygen- Introduction , Occurrence  Week(10): , preparation , Atomic and physical properties.  Week(11): Other forms of oxygen, Chemical properties of dioxygen O2 , Compounds of oxygen.  Week(12): Coordination chemistry : dioxygen as a ligand , physical properties and structure of water , chemical properties of water.  Week(13): Lanthanide elements  Week(14,15): Lanthanide contraction. | | Kamaran Basheer  Each lecture is 2hrs. |
| **18. Practical Topics (If there is any)** | |  |
| No practical topics | |  |
| **19. Examinations:**  ***1. Compositional:*** In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?  Examples:  - Explain the important of classification periodic elements.  -Compare between normal elements and lanthanide elements .  ***2.******True or false type of exams:***  In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provide.  Examples.  *-Elements in IA group are metals.*  *-P-Block elements such as N,P,O .*  ***3. Multiple choices:***  In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase. Examples should be provided. | | |
| **20. Extra notes:** | | |
| **21. Peer review**  .‌‌ | | |