

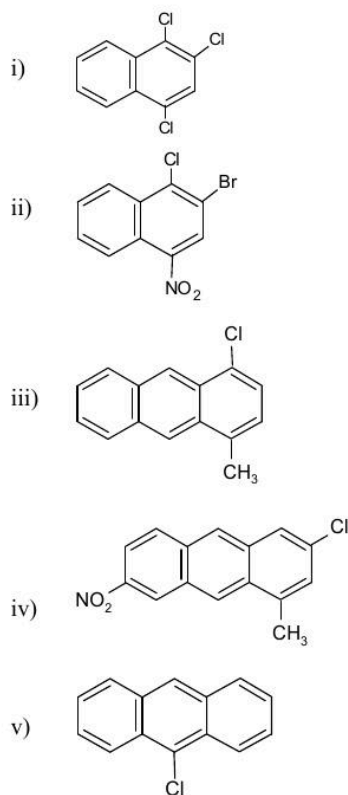
# BCHET-147: Organometallics and Bioinorganic Chemistry

|                        |                                            |
|------------------------|--------------------------------------------|
| Course Code            | BCHET-147                                  |
| Course Title / Subject | Organometallics and Bioinorganic Chemistry |
| Programme              | B.Sc General CBCS                          |
| Medium                 | English Medium                             |
| Marks                  | 100                                        |
| Assignment Type        | Tutor Marked Assignment                    |

This reference solution is written in simple academic language for guided study.

# Official Assignment / Syllabus Page

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- 14 (i) The attack of the electrophile in furan occurs at the C-2 (or  $\alpha$ ) position. Explain with the help of a suitable example. (3)
- (ii) Write the preparation of pyridine.
- 15 Give the schematic diagram of the order of molecular orbital energies and give the possible electronic transitions in them. (5)
- 16 Explain bathochromic shift with a suitable example. (5)
- 17 Explain the electronic spectra of the acetylenic and benzenoid chromophore. (5)
- 18 Explain the degrees of freedom for polyatomic molecules. (5)
- 19 i) List different factors which govern the position and intensity of bands appearing in the IR spectrum of an organic compound. (5)
- ii) The C–C stretching vibration is infrared inactive (or nearly inactive). Give reason. In which region, C–H stretching absorptions of alkanes are exhibited?
- 20 Give the characteristics bands observed in the IR spectra of carboxylic acids and carboxylic acid anhydrides. (5)

## Solved Answers

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### Answer 1: Give the reactions where sodium nitroprusside is used for the qualitative analysis for the detection of S<sup>2-</sup> and S in organic compounds. (ignoucollage.in)

About 250 words

The study and understanding of **give the reactions where sodium nitroprusside is used for the qualitative analysis** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

A systematic investigation into **give the reactions where sodium nitroprusside is used for the qualitative analysis** reveals several vital characteristics and operational methods. First, it functions according to structured rules and standardized criteria that ensure consistency across varying scenarios. Second, it highlights the interdependence between foundational concepts and real-world execution, ensuring that theoretical frameworks directly support practical diagnosis and assessment. Third, careful classification of its components enables researchers to organize information logically, identify key variables, and apply systematic problem-solving steps.

In applied contexts and practical scenarios—particularly within the institutional, socioeconomic, and environmental context of India—the relevance of **give the reactions where sodium nitroprusside is used for the qualitative analysis** becomes readily apparent. Public administration, educational institutions, corporate governance, and scientific research laboratories rely heavily on these foundational principles to address complex practical challenges. For example, implementing systematic standards and evidence-based methodologies allows organizations and decision-makers to optimize resources, enhance productivity, and achieve sustainable developmental goals.

In summary, a thorough mastery of **give the reactions where sodium nitroprusside is used for the qualitative analysis** is essential for achieving complete conceptual clarity in this field. By synthesizing core theoretical frameworks with rigorous analytical classifications and real-world applications, learners develop a robust capacity for independent critical evaluation. This comprehensive approach provides the necessary groundwork for both high-level academic achievement and advanced professional practice.

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### Answer 2: Give the differences between organometallic compounds and organic compounds. (ignoucollage.in)

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### **Answer 3: What is the structure of ferrocene in the solid state? What happens to the structure at extremely low temperature? (ignoucollage.in)**

About 250 words

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### **Answer 4: Explain the structure of Ni(CO)<sub>4</sub> based on valence bond approach. (ignoucollage.in)**

#### About 250 words

The study and understanding of **structure of ni(co)4 based on valence bond approach** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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#### **Answer 5: With suitable reactions (any two) explain reductive carbonylation. (ignoucollage.in)**

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### **Answer 6: How are binuclear carbonyls characterized? Give the structure of $\text{Fe}_2(\text{CO})_9$ and explain the different types of bond present in it. (ignoucollage.in)**

About 250 words

The study and understanding of **how are binuclear carbonyls characterized? give the structure of  $\text{Fe}_2(\text{CO})_9$  and explain** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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### **Answer 7: Give the following reactions for the formation of: (i) carbonylate anion by addition of alkali or reduction (any two) (ii) carbonyl hydrides (any one) (iii) carbonyls by displacement of CO by other ligands (any two). (ignoucollage.in)**

About 250 words

The study and understanding of **give the following reactions for the formation of: (i) carbonylate anion by** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations



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### **Answer 8: Discuss the classification of the elements on the basis of mechanism of action. (ignoucollage.in)**

**About 250 words**

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**Answer 9: Discuss the importance of cadmium of biological system. Why they cannot harm new bond babies? What is the effect of long term cadmium exposure in animals and human? (ignoucollage.in)**

About 250 words

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**Answer 10: What are the reactions involved in photosystem I and II. Give the Z-scheme of photosynthesis also. PART B: POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY (ignoucollage.in)**

About 250 words

The study and understanding of **reactions involved in photosystem i and ii. give the z-scheme of photosynthesis** represents a core analytical dimension within the subject. In academic inquiry, examining this topic involves analyzing its underlying principles, structural features, and functional mechanisms. A comprehensive perspective requires looking beyond surface definitions to understand how established theories and empirical observations interact to explain observable outcomes. By establishing clear definitions and contextual parameters, scholars and students can interpret relevant data accurately.

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