

Introduction to Organometallic Chemistry

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I) INTRODUCTION

Questions on Module I

01. Introduction to Organometallic chemistry

1. Suggest a criterion, other than those suggested by the instructor, for judging the importance of a subject.
2. What are the two methods of electron counting used by organometallic chemists?
3. Show that both methods yield the same result when applied to the following complexes. What are the electron counts?



4. In the Re complex pictured above, there are multiple structures which will satisfy the 18 electron rule.
 - a) What are they?
 - b) All of them cannot be distinguished from one another by NMR easily due to fluxional behavior. But suggest some other spectroscopic tool to distinguish between them, explain how you would use it.
5. Explain the following observations (If there are multiple explanations, give all of them)
 - a. Transition metal chemistry supports multiple oxidation states but main group metals prefer to form the ion with the noble gas configuration.
 - b. Carbon can have coordination numbers greater than four in transition metal coordination chemistry. Do you think VB theory can account for this phenomenon readily?