

Introduction to Organometallic Chemistry

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VII) Questions based on the dynamics and structures of organometallic compounds

29. The isolobal analogy

30. Fluxional Properties of Organometallics

31. Quantifying Steric and electronic factors

1. Draw the frontier M.O.s for the fragments ML_5 , ML_4 and ML_3 . Explain why CH is similar to $[Co(CO)_3]$ and BH to $[Fe(CO)_3]$.

2. Draw the frontier molecular orbitals of a methyl cation and a methyl anion. What would be a suitable transition metal fragment to interact with this species.

3. Using suitable examples, explain the fluxional modes called

- a. Rocking chair
- b. Ring whizzing

4. Explain the following observations (If there are two possible explanations, give both)

- A. Cyclooctatetraene forms fluxional complexes with $Fe(CO)_3$.
- B. Homoleptic complexes of Pd(0) have different stoichiometry with $P(tBu)_3$ and with $P(Me)_3$
- C. Tolman's cone angle and Nolan's buried volume are not perfectly correlated.