

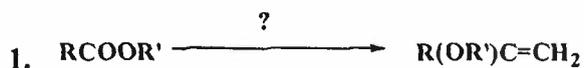
Mid Semester Exam

CH4101

Full Marks: 20

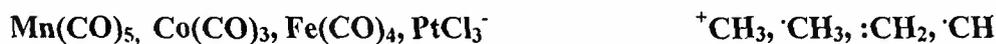
Time: 1h

Date: 17.09.18



Identify the reagent used for this transformation and draw its structure? (1)

2. Find the isolobal pairs from the following (1)



3. Explain metal-butadiene bonding and comment on their C-C bond distances upon metal coordination. (2)

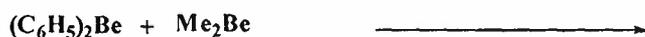
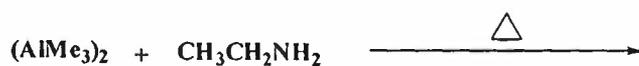
4. If you need to perform a sensitive reaction using toluene as a solvent, how do you make sure that the solvent is moisture free? Explain the reaction associated with. (2)

5. The NMR spectra of berrylocene at low temperature and room temperature are different whereas the NMR spectra of magnesocene remain similar on variation of temperature. Explain this observation. (2)

6. In Al_2Me_6 , the Al-Al bond distance is 2.6 \AA whereas the Al-Al bond distance in Al_2Cl_6 is 3.4 \AA . Explain the bonding situation in Al_2Me_6 . (2)

7. For Grignard reagent (CH_3MgBr), the ^1H NMR spectrum at room temperature indicates a single signal, however, at low temperature (below $-100 \text{ }^\circ\text{C}$) two signals were observed. In addition, the ^{25}Mg NMR of the Grignard reagent showed three signals. Explain this observation and suggest an appropriate reaction scheme. (2)

8. Complete the following reactions. (2)



9. Match the following (2)

a. Wilkinson catalyst

Hydroformylation reaction - $(\text{PPh}_3)_3\text{Rh}$.

b. MAO

Nucleophilic

c. Schrock carbene

Hydrogenation reaction ✓

d. Metal-hydrogen complex

π -acceptor ligand

Polymerization reaction

Electrophilic

10. $[\text{Co}_3(\text{CH})(\text{CO})_9]$ obeys 18e rule. Considering this fact draw its structure.(2)

11. In a chemical lab, there are two old bottles of chemicals where the labels are partially damaged. In one bottle, MeLi is visible whereas in another bottle, it shows $^t\text{BuLi}$. What would be your anticipation about the solvent in each bottle?

Justify your answer. (2)