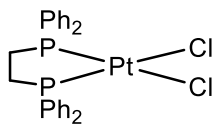


Spring 2025 - Chemistry 3840
Assignment #2

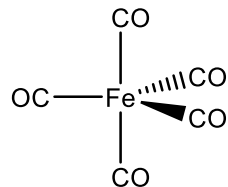
1. For *each* of the following molecules:
 - (i) Name the molecule using IUPAC convention. If there are any errors in the given formulae, provide the correct chemical formulae. (8 points)
 - (ii) Based on what we learned in class, *assign the correct geometry* and *draw the structure*. Indicate whether different *isomers* are possible (within your chosen geometry). Draw them and state what kind of isomer it is. (24 points)
 - a) $\text{Pd}(\text{NH}_3)(\text{NH}_3)(\text{Cl})\text{Br}$
 - b) $\text{K}_3[\text{IrBr}_3\text{Cl}_3]$
 - c) $[\text{AuCl}(\text{PPh}_3)]$
 - d) $[\text{ReOBrCl}_2(\text{PEt}_3)_2]$
 - e) $\text{Li}_2[\text{NiCl}_4]$
 - f) $[\text{Fe}(\text{N}(\text{SiMe}_3)_2)_3]$
 - g) $[\text{Cr}(\text{Si}(\text{SiMe}_3)_3)_3]$
 - h) $[\text{Ir}(\text{CO})\text{Cl}(\text{H})_2(\text{PMe}_3)_2]$
2. For *each* of the following molecules:
 - (i) Provide the chemical formula according to IUPAC convention. If there are any errors in the given name, provide the correct name. (6 points)
 - (ii) Based on what we learned in class, *assign the correct geometry* and *draw the structure*. Indicate whether different *isomers* are possible (within your chosen geometry). Draw them and state what kind of isomer it is. (9 points)
 - a) tetra(trimethylphosphine)palladium(II)
 - b) di- μ -bromobis[bis(diphenylphosphino)ethaneplatinum(II)] cyanide
 - c) trihydridomanganese(III)

3. For each of the following molecules:
Provide both the name *and* chemical formula according to IUPAC convention. (12 points)

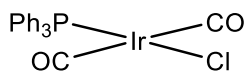
a)



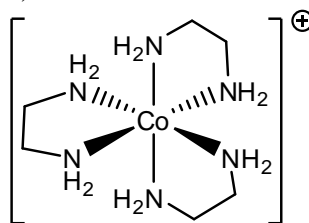
b)



c)



d)



4. Give an example of a coordination isomer of $[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$ and a linkage isomer of $[\text{NBu}_4][\text{Pt}(\underline{\text{SCN}})_3(\text{PET}_3)]$. (8 points)
5. a) Predict the product if one equivalent of $^{\text{Me}}\text{tacn}$ was added to $\text{Sc}(\text{CH}_2\text{SiMe}_3)_3(\text{THF})_2$ (**1**). Would you expect the product(s) to be more or less stable than starting material **1**? What geometry would you expect the product to adopt? Draw the compound. (12 points)
- b) Would you expect $\text{Sc}(\text{CH}_2\text{SiMe}_3)_3(\text{THF})_2$ or $\text{Sc}(\text{CH}_2\text{SiMe}_2\text{Ph})_3(\text{THF})_2$ to react more rapidly with $^{\text{Me}}\text{tacn}$? Why? (5 points)

$^{\text{Me}}\text{tacn} = 1,4,7\text{-trimethyltriazacyclononane}$

