

TODAY'S TOPICS

- periodic trends
- HSAB theory
- VSEPR theory
- crystal field theory
- ligand field theory
- metal–ligand bonding

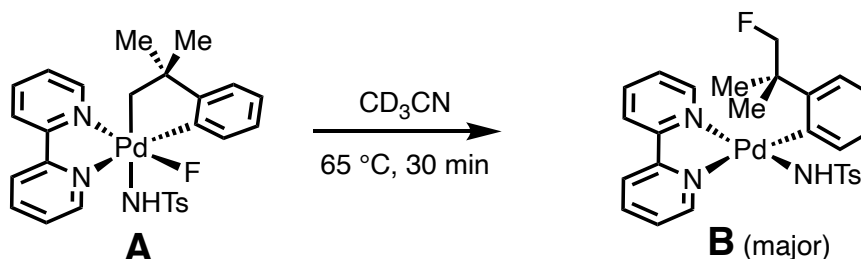
CHEMIST OF THE DAY



name?
institution
known for?

PROBLEMS OF THE DAY

#1 Cyclometallated palladium species **A** rapidly undergoes reductive elimination to give **B**.



A. For both complexes, provide the (a) coordination number, (b) d-electron count, (c) geometry, (d) metal oxidation state, and (e) total electron count.

B. For both complexes, provide the d-orbital diagrams predicted from CFT.

#2 Predict whether the following complexes are high or low spin: (a) $[\text{Co}(\text{H}_2\text{O})_6]^{3+}$, (b) $[\text{Ni}(\text{CN})_4]^{2-}$, (c) $[\text{CoF}_6]^{3-}$

#3 **A.** CO is one of the most important ligands in organometallic chemistry. Draw possible isoelectronic ligands.

B. Consider the list of ligands from Part A. Predict if their respective σ -donating and π -accepting ability, and design an experiment to test your prediction.

QUOTE OF THE DAY

"Persistence in scientific research leads to what I call instinct for truth."

- Louis Pasteur

READING

Hartwig: Ch. 1.3–2.2
Crabtree: Ch. 1.5–1.11

#4 Using the orbital diagrams of O_2 and N_2 , explain why they bond to metals with different geometries (i.e., which is linear/bent?).