

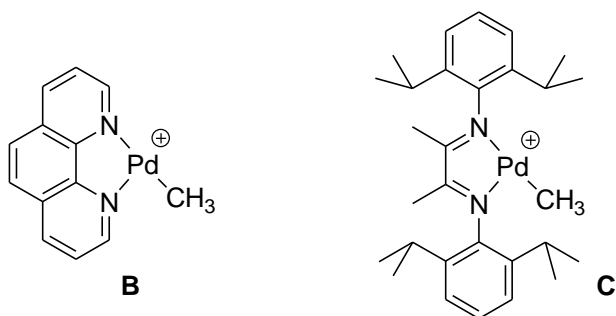
Homogeneous Transition-Metal Catalysis SS 2014

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Problem set 1

Question 1

Cationic palladium complexes like **B** or **C** can catalyse the dimerisation of ethylene to butene as well as the polymerisation to polyethylene.



- Suggest a plausible reaction mechanism for the dimerisation and polymerisation of ethylene, respectively.
- Which complex leads to dimerisation, which one to polymerisation? Explain your choice based on the mechanism and the ligand structure.

Question 2

- How does the splitting of the d-orbitals change as you go from octahedral to square bipyramidal, to square pyramidal and square planar ligand field?
- How does the d-orbital splitting in an octahedral complex change if one ligand exhibits π -back bonding? How does the situation change with a dative π -bond? Given an example for each.

Question 3

For the following complexes assign the coordination geometry, oxidation state of the metal, d-electron configuration and the valence electron count.

