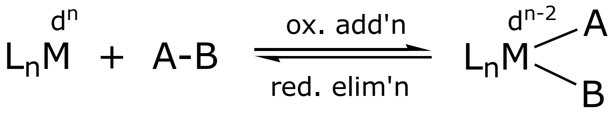
Reminder: Oxidative Addition (O.A.) and Reductive Elimination (ER):

Δ O.S. =	**-2**
Δ C.N. =	**-2**
Δ V.E. =	**-2**
Δ d^n =	**+2**



Δ O.S. =	**+2**
Δ C.N. =	**+2**
Δ V.E. =	**+2**
Δ d^n =	**-2**

ER favoured for electron-deficient metal requires:

- Saturated 18 e- complexes.
- Two ligands that can eliminate cis to one another.
- M with accessible lower OS separated by 2 units.
- Mostly concerted pathway with non-polar three center transition state ((H_2, Si-H, C-C)

O.A, common for d^8 and d^{10} metals, requires:

- Non-bonding electron density at the metal.
- A vacant coordination site.
- M with accessible higher OS separated by 2 units.

4 types of mechanism: concerted ,S_N2, ionic radical.

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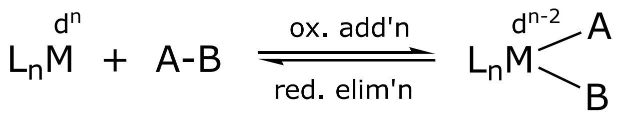


Δ O.S. = **+2**

Δ C.N. = **+2**

Δ V.E. = **+2**

Δ d^n = **-2**

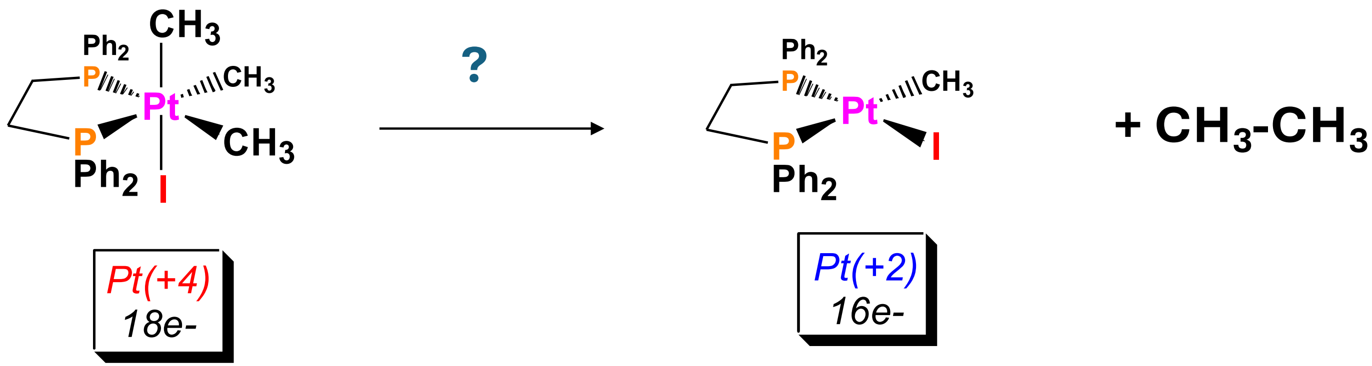
ER favoured :

- Electron-poor metal center
- Π-acid ligands ligands with electron-withdrawing groups
- Bulky ancillary ligands
- Smaller metals
- Electron rich A and B ligands

O.A, favoured:

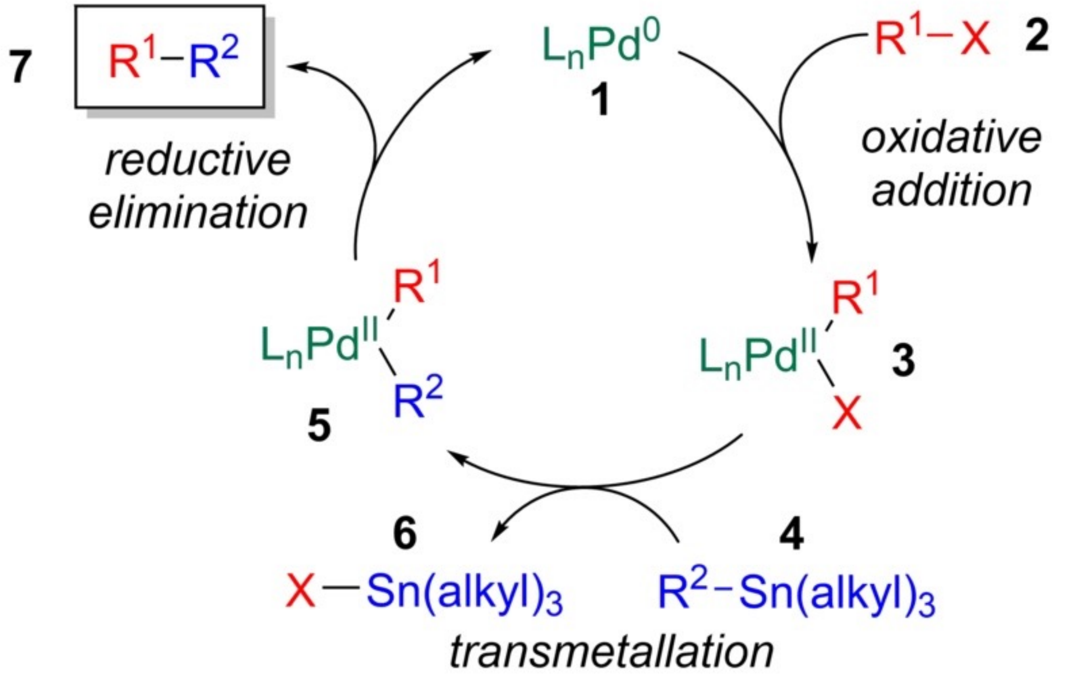
- When the metal is electron rich (π-basic).
- Whit hard or strong σ-donor ancillary ligands.
- Small ligands are present.
- The metal is large.
- For strong M-A and M-B and weak A-B bonds.

Reminder : Reductive Elimination



But … mechanism involves loss of I^- in the first step to create a electron-deficient specie
Then iodide binds again to give square planar 16 e complex

Reminder: Application: Pd-catalyzed cross-coupling cycle (Stille, Sonogashira, Susuki)



R^1, R^2 = allyl, alkenyl, aryl; X = Cl, Br, I, OTf, etc.

L = phosphine; alkyl = Me, Bu