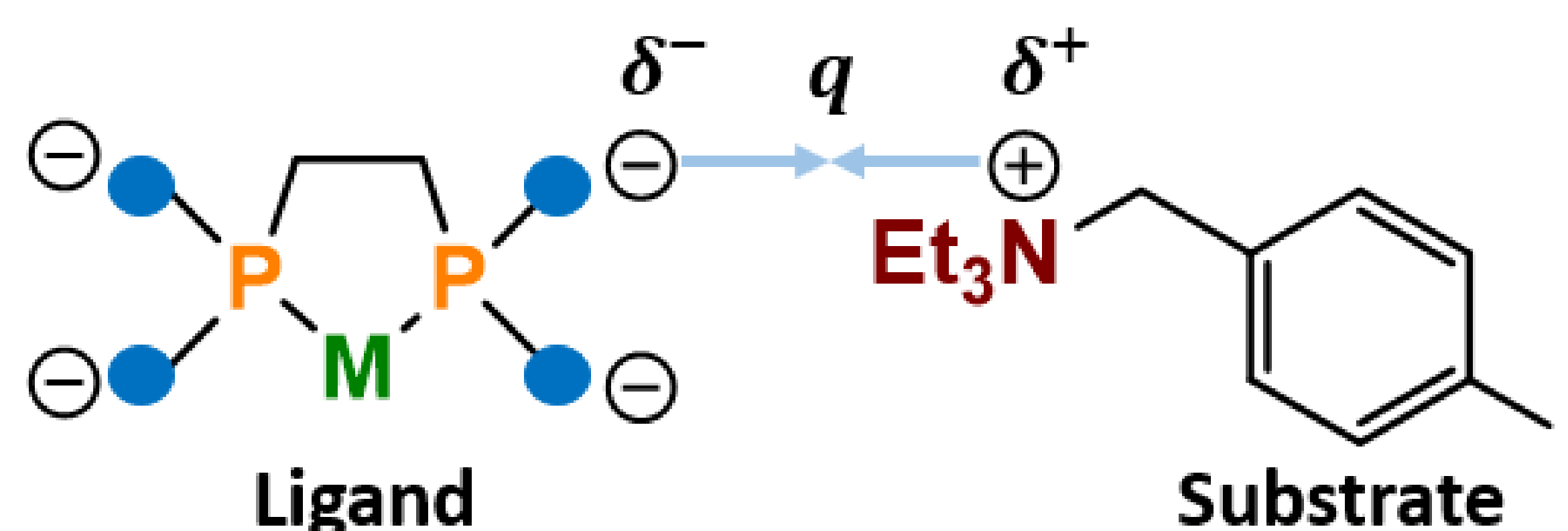
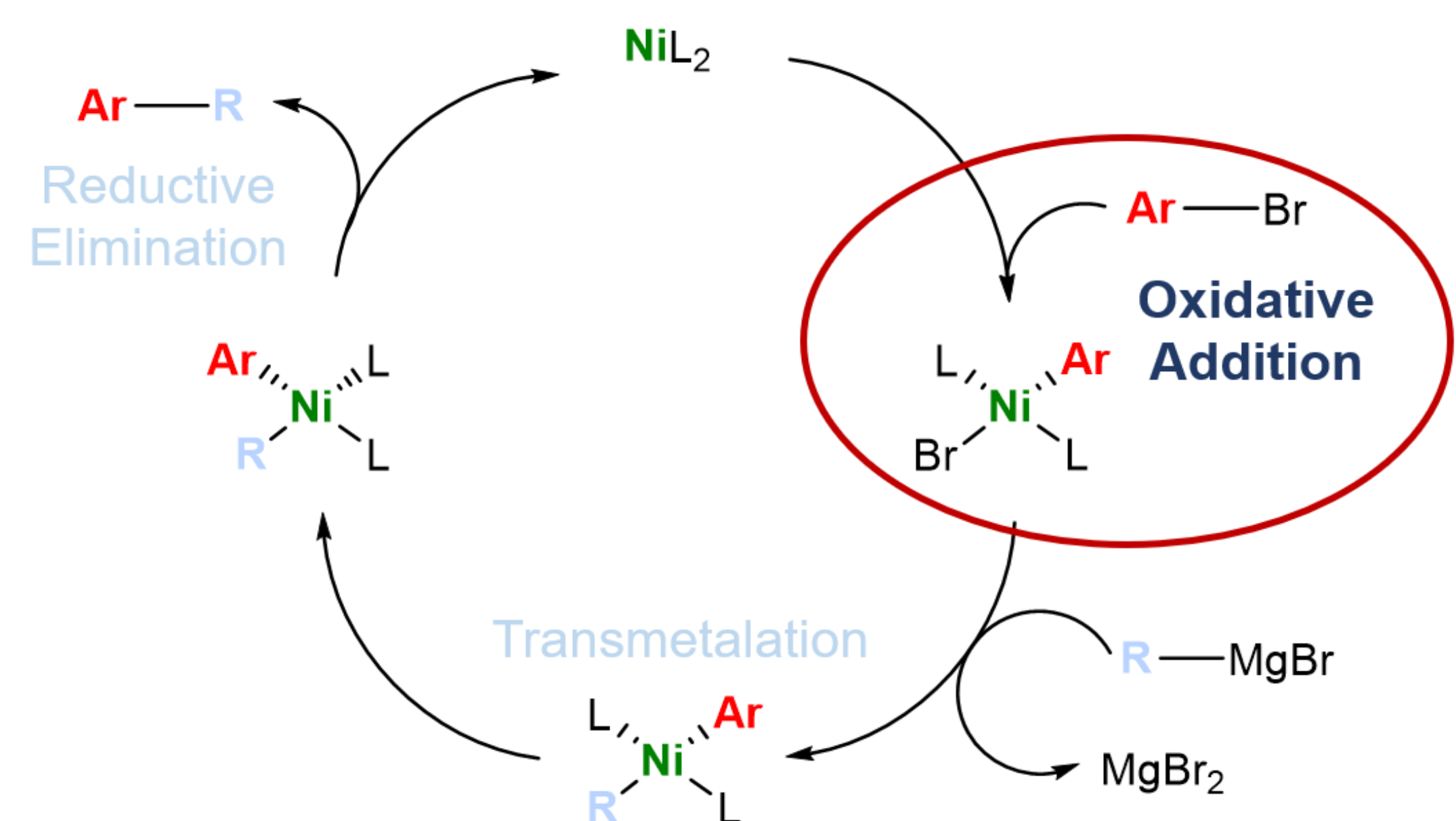




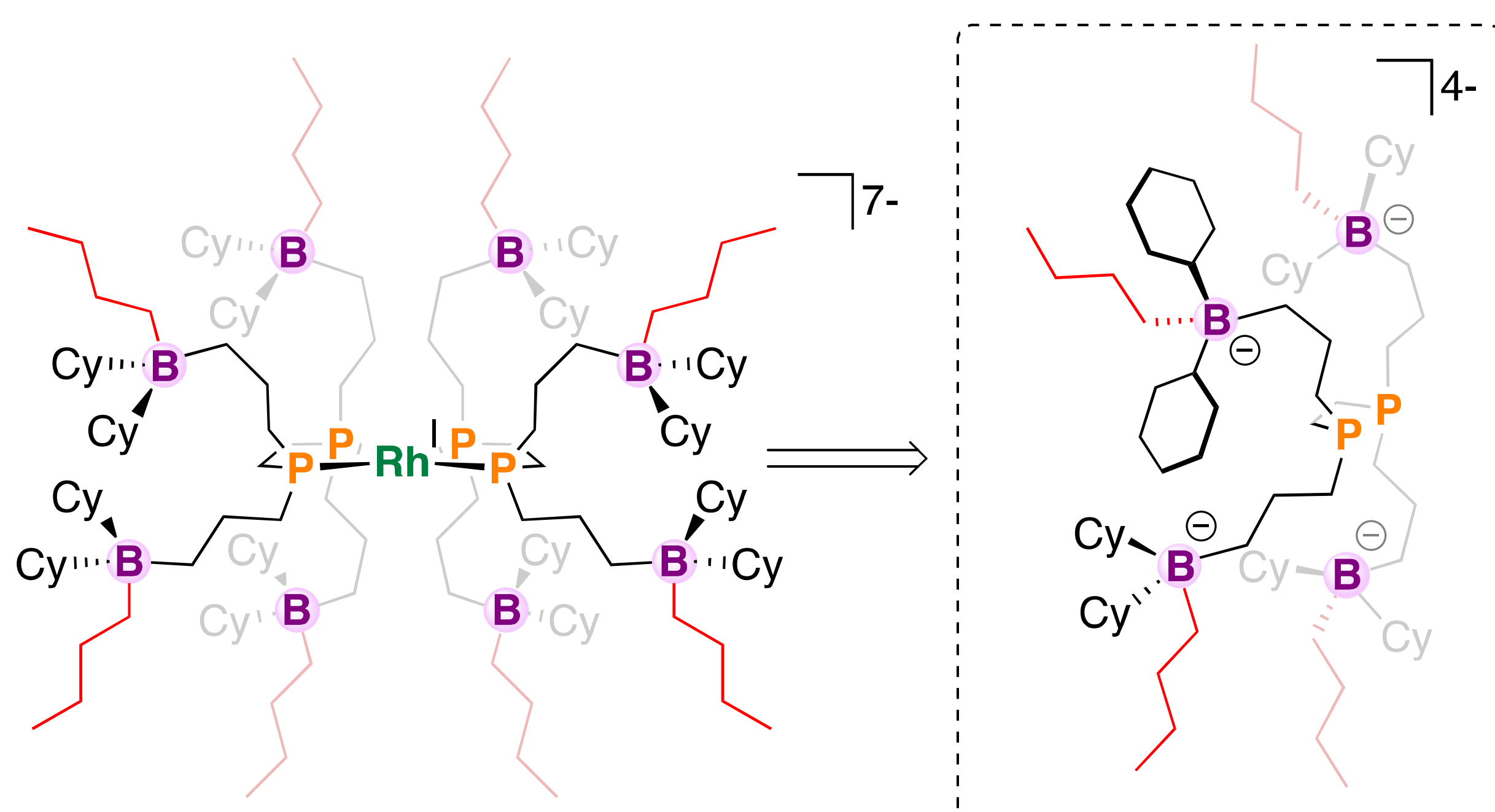
## Electrostatic forces influence each other according to Coulomb's Law



Proposed ligand and substrate undergo **oxidative addition**. Charge can influence rate through attraction forces. Improving reactivity in this step indirectly **improves cross-coupling** reactions which are important for the production of pharmaceuticals that make use of new **aryl-aryl bonds**.

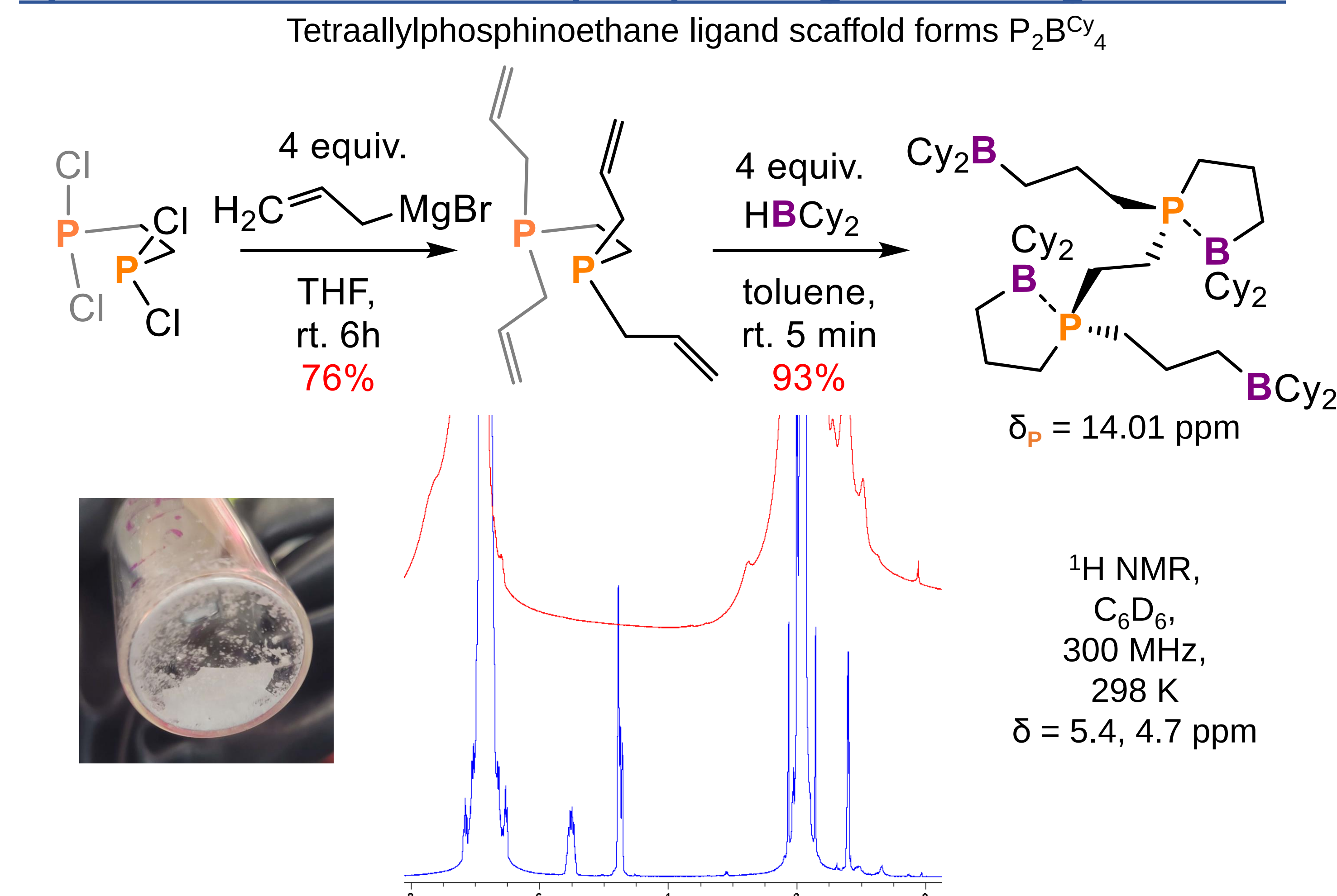


## Previous synthesis of charged rhodium (I) octaboranyl complex by the Drover Group

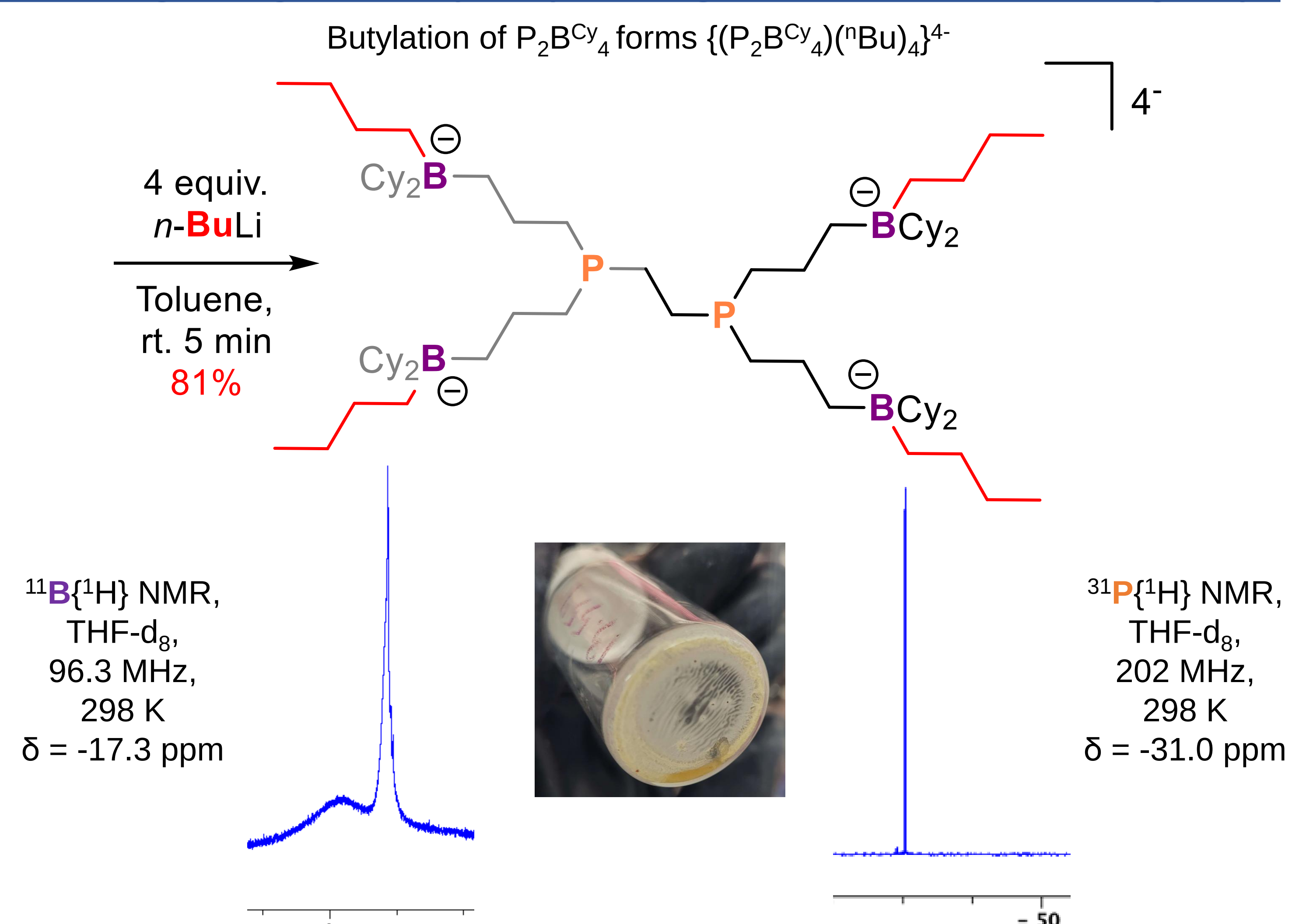


Rhodium complex **affected hydride transfer**. Charged secondary coordination sphere (SCS) involved.

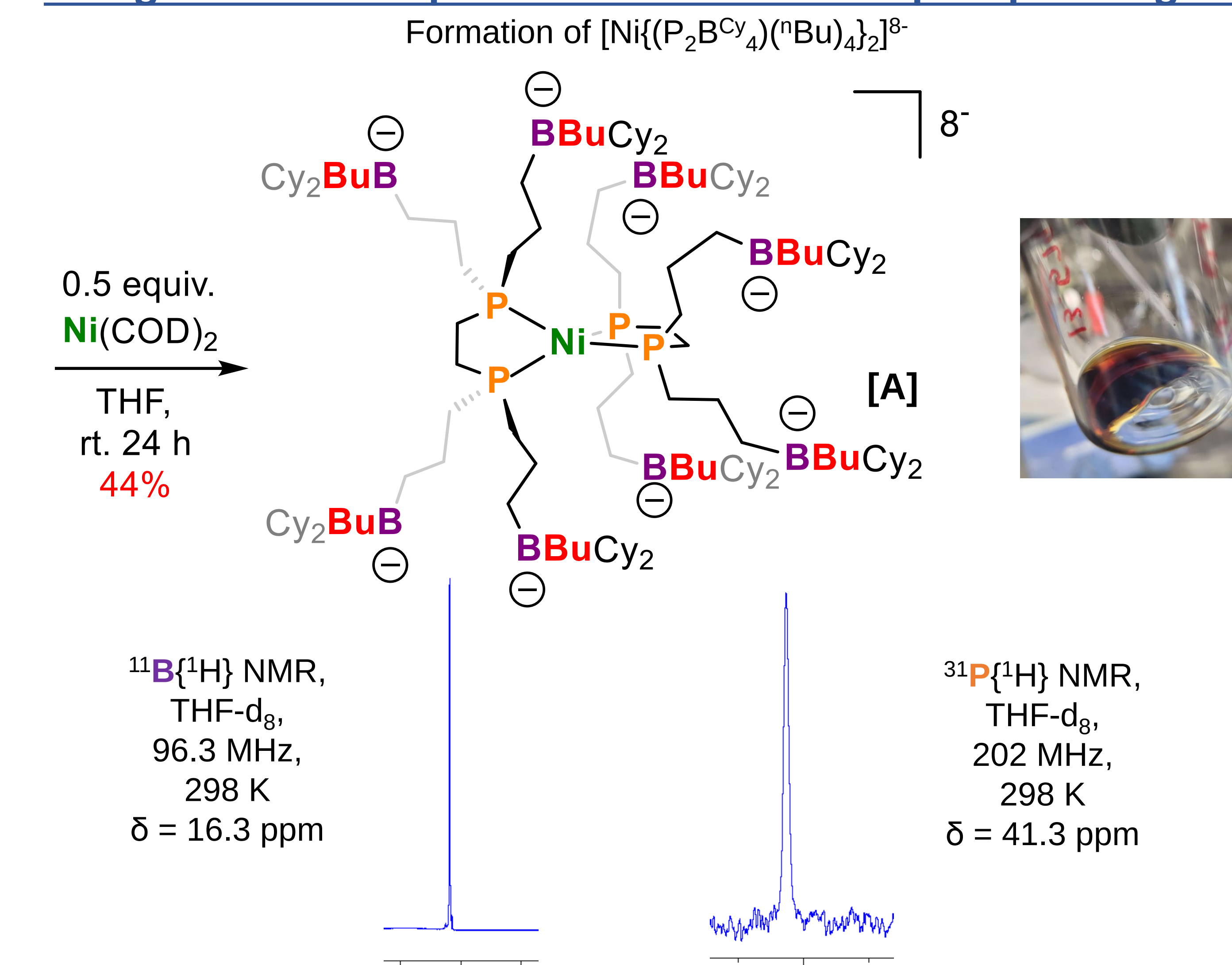
## Synthesis of unsaturated diphosphine ligand starting materials



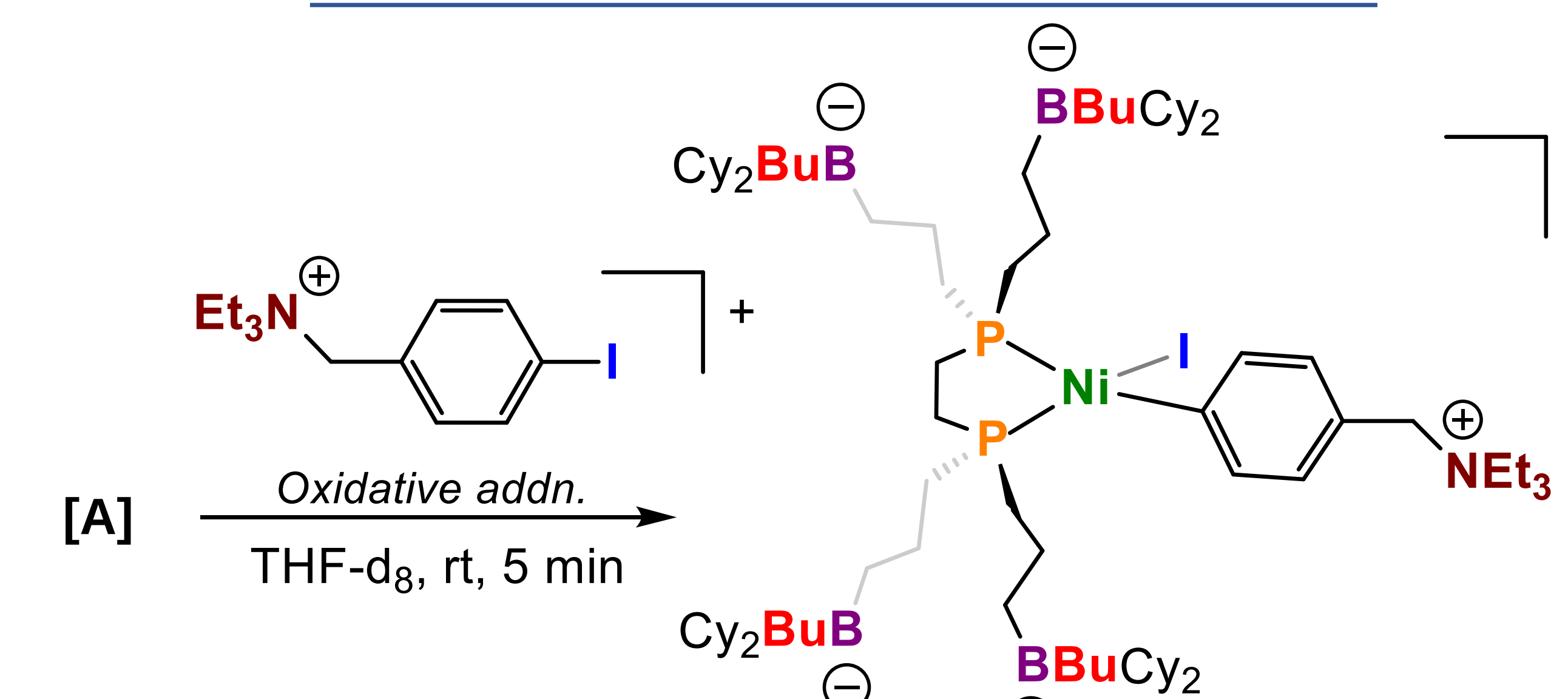
## Installing charge into diphosphine ligands with borate-end groups



## Charged nickel complex with tetraanionic diphosphine ligands



## Future work: oxidative addition studies



Proposed **rate enhancement** through **ion-pairing interactions** between catalyst and substrate

## Key References

Previous work from the Drover group: a) *Organometallics*. **2021**, 40, 2450. b) *Chem. Eur. J.* **2020**, 26: 11180. Precedent for other charged ligands: a) *Organometallics*. **2022**, 41, 2605. b) *Angew. Chem. Int.* **2013**, 52, 534.

