

# Heterobimetallic Complex for Homo- and Copolymerization

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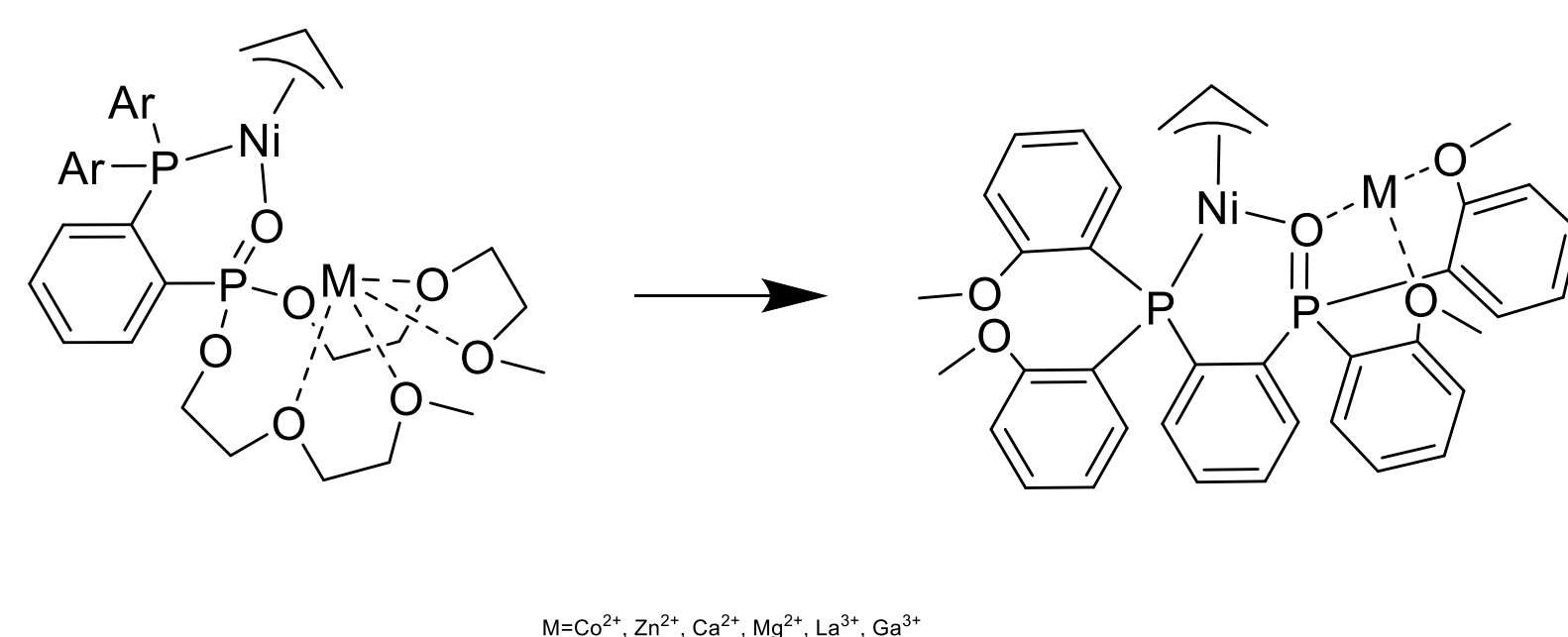
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## Background

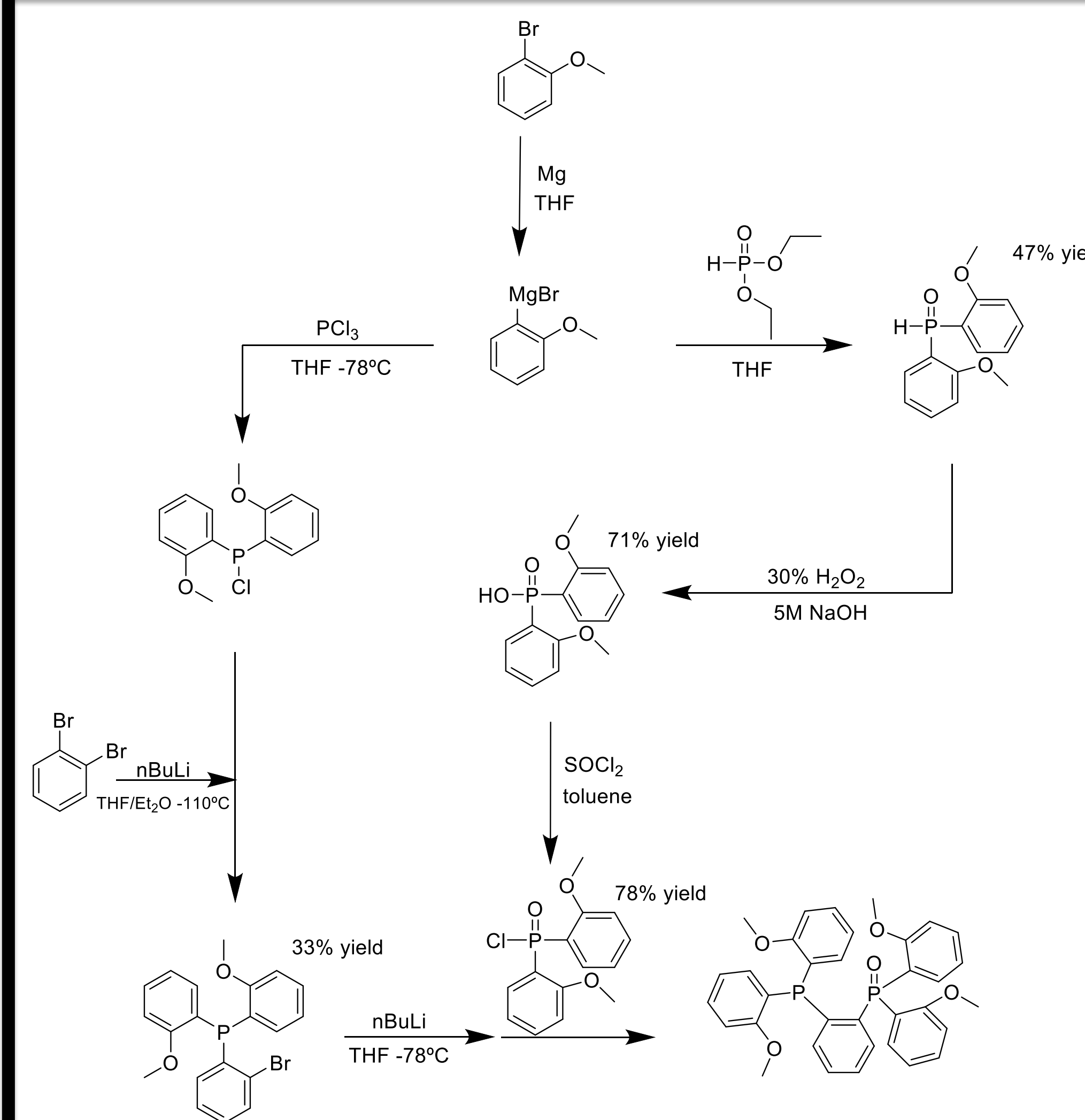
Polar polymers have interesting properties compared to their non-polar counterparts. These materials can be used as water-resistant paints, adhesives, and drug delivery devices. The disadvantages of these materials is the difficult manufacturing process. This is why catalyst that are efficient in olefin homo- and copolymerization are being developed. These catalyst are being designed to be able to fabricate high density polyethylene (HDPE), low density polyethylene (LLDPE), and monomer insertion by tuning the catalyst.

## Catalyst Design

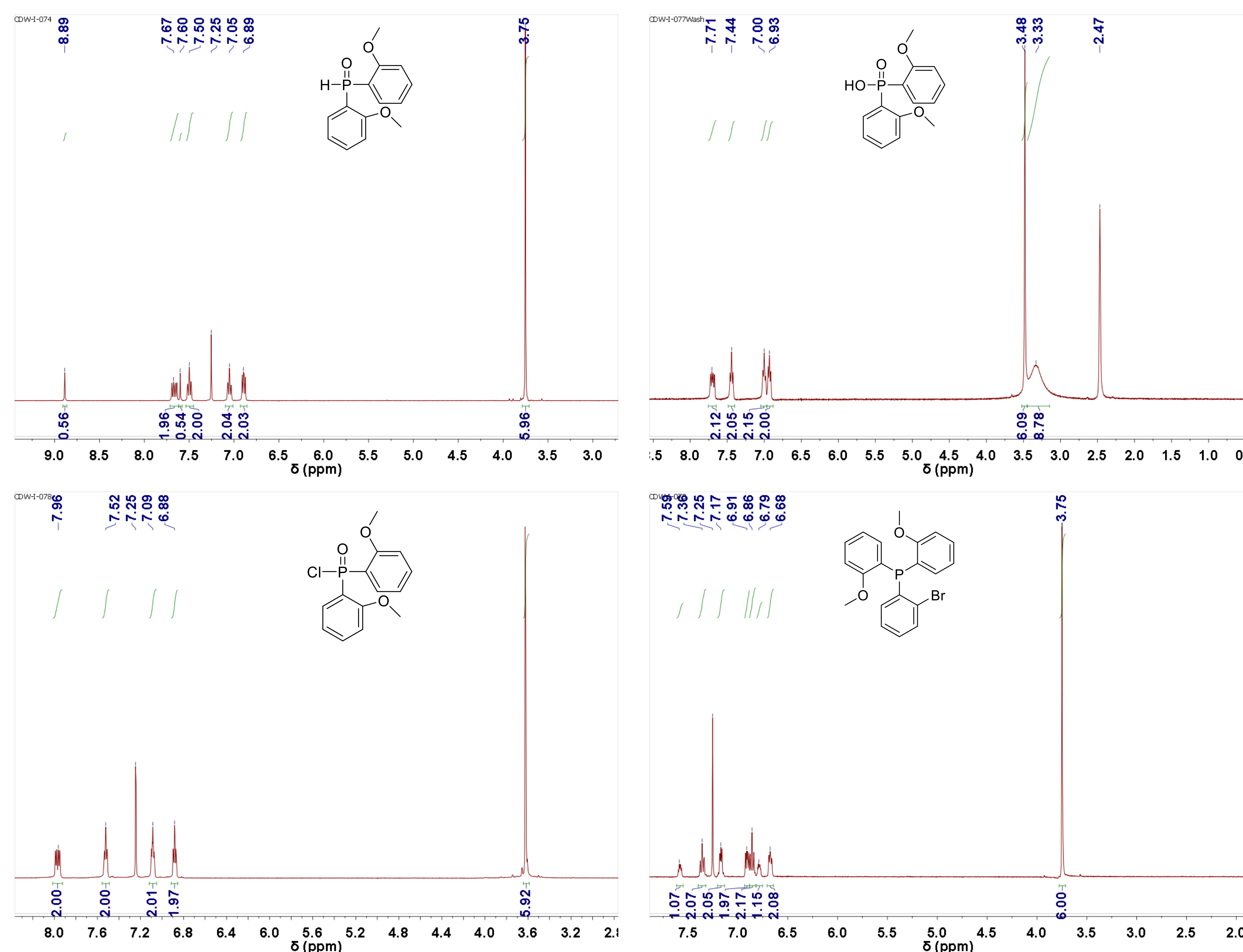
- Designed after Dr. Xiao nickel phosphine phosphonate polyethylene glycol catalyst<sup>1</sup>.
- Goal is to change the electrophilicity of the catalyst by introducing a second metal<sup>2</sup>.



## Synthesis Route

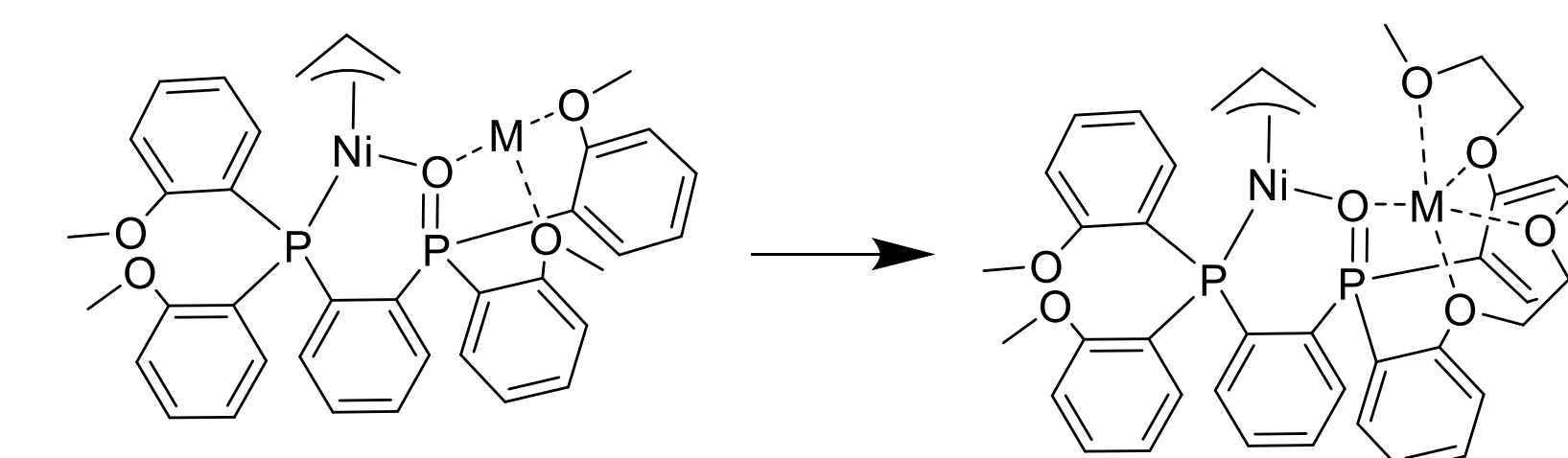


## Characterization



## Future Work

- Metalate and run polymer tests with the current design.
- Synthesize new ligand design.



## Acknowledgements

- Summer Undergraduate Research Fellowship
- Dr. Do and his graduate group
- Dr. Xiao



## References

- Dawei Xiao, Zhongzheng Cai, Loi H. Do. Heterobimetallic Complexes Supported by PhosphinePhosphonate donors for Ethylene Homo and Copolymerization in Polar Solvent.
- Zhongzheng Cai, Loi H. Do. Thermally Robust Heterobimetallic Palladium-Alkali Catalysts for Ethylene and Alkyl Acrylate Copolymerization. *Organometallics* 2018 37 (21), 3874-3882. DOI: 10.1021/acs.organomet.8b00561