Using N,O to get to Yes. Catalytic Amination for Small Molecule and Polymer Synthesis

Laurel L. Schafer*
The University of British Columbia
Vancouver, BC, CANADA
schafer@chem.ubc.ca

N,O-Chelated complexes of early transition metals offer unique reactivity in atom economic hydrofunctionalization transformations, such as hydroamination and hydroaminoalkylation. The efficient synthesis of selectively substituted amines and N-heterocycles from broadly available alkyne or alkene starting materials offers new opportunities for assembling small molecules and amine containing polymers. Mechanistic insights have advanced N,O-chelated catalyst development to realize improved substrate scope, enhanced regioselectivity and greater TONs and TOFs.[1] These catalyst efficiencies have been leveraged in the synthesis of amine containing polymers to access new classes of conjugated materials by hydroamination catalysis,[2] and pendant amine containing polymers by hydroaminoalkylation.[3] These new polymers display tunable properties that can be attributed to the incorporation of unprotected amine functionality into these novel materials.

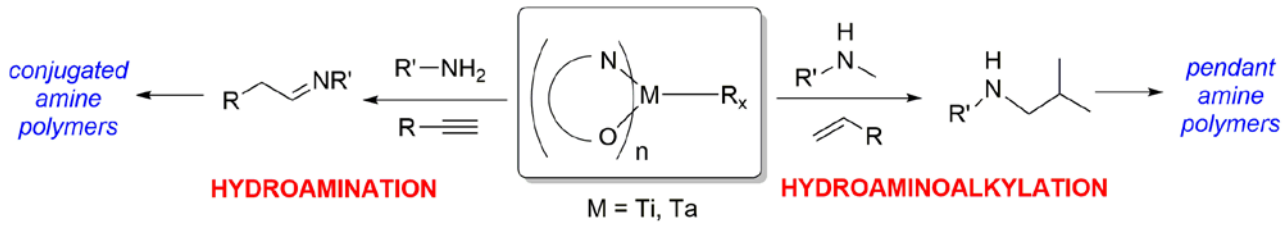

Figure 1 N,O-Chelated early transition metal complexes for the catalytic synthesis of amine containing small molecules and materials.

1 R. C. DiPucchio, S.-C. Rosca, L. L. Schafer, *Angew. Chem., Int. Ed.* **2018**,*19*, 3469.
2 H, Hao, K. A. Thompson, Z. M. Hudson, L. L. Schafer, *Chem. Eur. J.* **2018**, *24*, 5562.
3 D. J. Gilmour, T. Tomkovic, M. R. Perry, E. Hsiang, S. G. Hatzikiriakos, L. L. Schafer, *Manuscript Submitted.*