LEWIS ACID ENABLED NOVEL REACTIVITIES IN ASYMMETRIC COPPER CATALYSIS

Syuzanna R. Harutyunyan

Stratingh Institute, University of Groningen, Netherlands, Nijenborgh 4, 9747 AG, Groningen, Netherlands

Our research program [1-7] is aimed at the development of novel catalysis concepts for the asymmetric synthesis of chiral functional molecules. In 2011 we introduced an entirely new role for Cu(I)-based catalysts, facilitating highly enantioselective carbon-carbon bond forming reactions between organometallics and enolisable carbonyl as well as imine compounds. Following this initial discovery, we established Cu(I)-catalysis, in combination with Lewis acids/Grignard reagent, as a powerful tool to tackle the reactivity of inherently unreactive substrates for carbon-carbon bond forming reactions. In this lecture I will focus on how we can use these concepts to access valuable chiral heteroarenes and amides, as well as tertiary alcohols and amines, in catalytic and enantioselective fashion. Recent results involving Lewis acid strategy that enabled us dearomatisations as well as tackling the reactivity of unprotected carboxylic acids will also be presented.

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