

Application of De(hydrogenative) Transformations in Chemical Synthesis

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Abstract: Due to the growing concern for the rapid fossil fuel depletion, the synthesis of valuable organic compounds utilizing alternatives raw materials is an area of intense research. In this regard, chemicals derived from lignocellulose biomass can set the best example as renewable starting materials. Acceptorless Dehydrogenation (AD) and Borrowing Hydrogen (BH) catalysis are the two extremely powerful approaches, which can directly utilize the alcohols for the production of various fine chemicals via C-C and C-heteroatom bond-forming reactions.¹ Instead of releasing toxic chemical wastes, the major advantages of the AD and BH catalysis is that it either can releases dihydrogen molecules in the absence of sacrificial hydrogen acceptor or utilizes the dihydrogen molecules in the hydrogenation step .

We have recently developed new air-stable ruthenium and earth-abundant manganese-based tridentate metal complexes and explored their activity toward different AD coupling reaction BH catalysis.² The scope and limitation of these complexes towards the synthesis and functionalization of various heterocycles have been investigated. The lecture will cover the fundamental concepts of AD and BH catalysis and details of these works.

References:

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