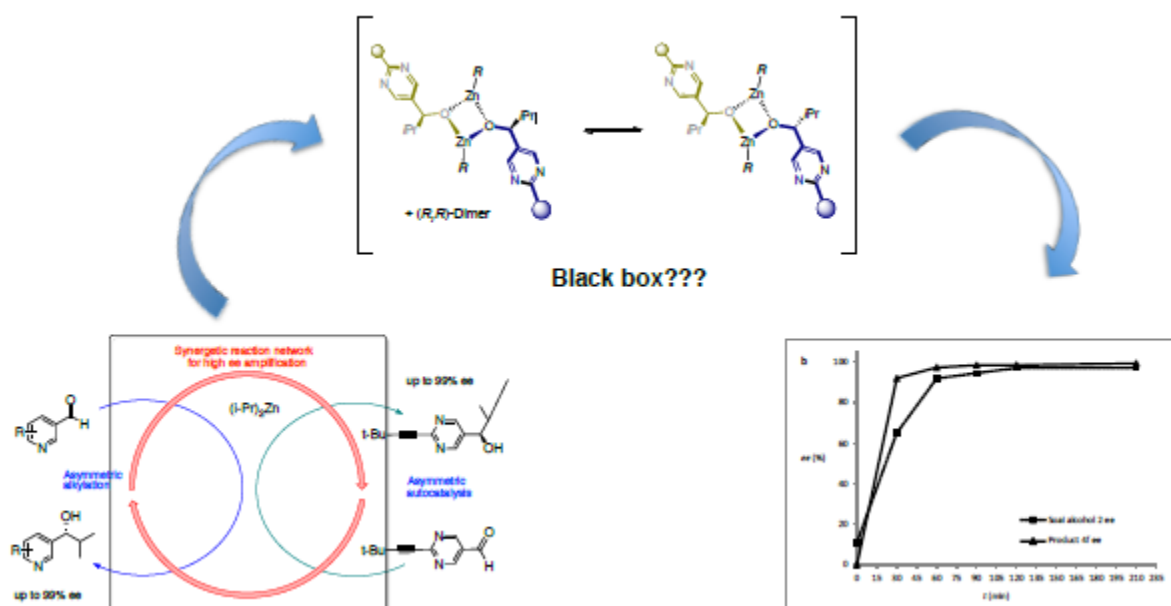




Exploring the mechanism of amplification of chirality in parallel systems.



Motivation and challenge: The demonstration of asymmetric amplifying autocatalysis has excited interest far beyond the organic chemistry community. This arises both from the fact that autocatalysis is an intrinsically interesting phenomenon, and also from its possible connection to the origins of life.

Objectives and scope: In ongoing research coupling autocatalysis with asymmetric induction we observed an unusual non-linear effect for amplifying chirality in two interdependent autocatalytic processes operating in parallel. Our preliminary results suggest the formation of new aggregates and different intermediate species. We aim at NMR studies to establish the structures of the aggregates, e.g. monomers or dimers (*R,R*)- or (*R,S*)-adduct, together with kinetic experiments to determine the structures of the activated complexes. Structural analysis and structure-property correlations will be explained and predicted by structural, semi-empirical, and ab initio calculations.

Skills to be developed: Chemical synthesis, Handling of organometallic and air-sensitive compounds, advanced NMR techniques and kinetics, molecular modeling.

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