



Inorganic Chemistry
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Sustainable and Cooperative Catalysis

Countless applied catalytic processes rely on unsustainable methodologies, e.g. using low-abundance precious metals, generating considerable waste, and requiring extreme reaction conditions. We develop next-generation catalytic systems targeting sustainable transformations. We tackle this on two fronts. The Single-Centre Ambiphiles, a novel ligand class developed in our group, allows for cooperative bond activation *via* unprecedented mechanistic pathways. Exploring this facet of cooperative bond activation allows for mild and waste-free catalytic transformations, with a focus on ammonia utilization. In addition, we work towards utilizing Mg and Ca, two of the most abundant metals on our planet, in achieving 'transition-metal-mimicking' catalytic processes, such as hydroformylation and hydrogenation. This is all grounded in organometallic synthesis, giving us the opportunity to thoroughly understand the chemistry at play in these systems.

