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Development of New Catalytic Systems. Applications in Asymmetric Catalysis

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ABSTRACT

In our group we are involved in the rational design of reagents, ligands or catalysts with modulated steric and electronic properties and the development of new activation modes to be implemented in (enantio)selective Organic Synthesis. Over years we have exploited the nucleophilic character of hydrazones (masked acyl anion equivalents) in asymmetric synthesis. In particular, the use of formaldehyde *N-tert*-butylhydrazone in combination with bifunctional H-bonding organocatalysts enabled efficient enantioselective functionalization of neutral electrophiles, mainly carbonyl compounds.[1] On the basis of this knowledge, we have recently developed an interesting strategy of anion-binding catalysis which is based on the simultaneous chloride recognition by H-bonding organocatalysts and *N-tert*-butyl hydrazones, affording a tool for asymmetric dearomatization of isoquinolines with high stereocontrol.[2]

On the other hand, and concerning our interest in Gold chemistry, recent results on Au(I)-catalyzed alkynylation reactions will be also discussed.[3] Finally, results of silver-free gold-catalyzed heterocyclizations through intermolecular H-bonding activation using modulable monosulfonyl squaramides as an example of synergistic gold(I) and anion-binding catalysis, will be also presented.[4]

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