Novel Oligomeric Helical Chiral Catalysts for Asymmetric Dearomatization

Significance: García Mancheño and co-workers report a novel class of helical chiral tetrazole-based oligomers for anion-binding catalysis. After screening different motifs, their best catalyst (3) was successfully employed in the asymmetric deearomatization of quinolines 1 to afford products 2 in good yields and with good to excellent enantioselectivities. NMR titration experiments suggest the presence of a cooperative H-bonding network, which binds the chloride anion, accommodated inside the helical cavity.

Comment: The authors developed a novel class of catalysts with comparable binding properties to well-developed thiourea-based organocatalysts (see Review below). They propose a fast conformational interconversion of structure 3 in the absence of the halogen (low stereocontrol). However, upon coordination to the anion, the helical chirality is reinforced, thus enabling highly enantioselective transformations such as the reported deearomatization of quinolines.