A Cellulose-Supported DNA-Based Ligand for Asymmetric Catalysis

Significance: Copper-catalyzed asymmetric Friedel–Crafts alkylations (eq. 1) and Michael additions (eq. 2) proceeded in the presence of cellulose-supported calf thymus DNA and 4,4′-dimethyl-2,2′-bipyridine (dmbpy) to give the corresponding alkylation products with up to >99% conversion and up to 97% ee.

Comment: In the formation of compound A, the catalyst was recovered and reused nine times without adding any copper or dmbpy. Compound A was also prepared in 96% conversion and up to 80% ee by a continuous-flow process using the DNA-based catalyst packed in a medium-pressure liquid chromatography cartridge (residence time: 38 min, room temperature).