Asymmetric Ring-Opening of meso-Epoxides with a Chiral Metal-Organic Framework

Significance: A chiral MOF (UTSA-32) was prepared from (S)-4,4′-dibromo-6,6′-dichloro-2,2′-diethoxy-1,1′-binaphthyl in three steps (eq. 1). UTSA-32 catalyzed the enantioselective ring opening of meso-epoxides with anilines to give the corresponding α-hydroxyamines in 69–95% yield with 12–89% ee (11 examples, eq. 2).

Comment: UTSA-32 was characterized by single-crystal X-ray diffraction, PXRD, TGA, and BET analyses. Single-crystal X-ray diffraction analysis of UTSA-32 revealed that the binuclear zinc clusters are bridged by the carboxylic groups of organic linker L to form a three-dimensional framework.