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Homochiral Metal-Organic Frameworks for Heterogeneous Asymmetric Catalysis


Asymmetric Catalysis with MOFs Prepared via Chiral Induction Effect

**Significance:** Homochiral metal-organic frameworks (MOFs) were prepared through the chiral induction effect. Thus, the homochiral crystallization of Ce(NO$_3$)$_3$·6H$_2$O and H$_2$MDIP was performed with L- or D-BCIP as chiral inducers in water to give Ce-MDIP1 and Ce-MDIP2 (where no BCIP was installed), which exhibited Cotton effects exactly opposite to each other. Ce-MDIPs promoted the cyanosilylation to give the corresponding cyanohydrin derivatives quantitatively with 93 to >98% ee.

**Comment:** Ce-MDIP1 was reused twice without significant loss of catalytic activity. Cd-TBT was also prepared from Cd(ClO$_4$)$_2$·6H$_2$O and H$_3$TBT under similar conditions. Cd-TBT mediated the direct aldol reaction of aldehydes and cyclohexanone to afford the corresponding β-hydroxy ketones in 8–97% yield with 58–61% ee in ten days.