The ZACA reaction (eq. 1) discovered in 1995 is related but discrete from the Ziegler-Natta-Kaminsky polymerization and the Dghemilev ethylmagnesation (Avoid polymerization and cyclic carbozirconation: Breakthrough No. 1).

The lower enantioselectivity in methylalumination can be circumvented (Breakthrough No. 2).

A series of 2 asymmetric processes of an average of 80% ee leads to an overall enantioselectivity of ≥ 98% ee (Well-known Principle No. 1).

Diastereomeric mixtures of can be readily separated by chromatography. (Breakthrough No. 3).

One-pot homologation of deoxypolypropionate chains can be achieved in ca. 70% yields (JACS 2005, 127, 2838) (Breakthrough No. 4).

Combined use of ZACA reaction and the lipase-catalyzed acetylation is synergistic and practical (ASC 2007, 349, 539). Through exploitation of the findings and known principles, a wide range of charal natural products can be asymmetrically synthesized..