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ENANTIOSELECTIVE PREPARATION OF CYANOHYDRINS CATALYSED BY CYCLIC DIPEPTIDES

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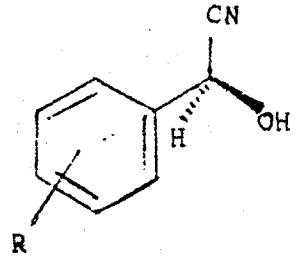
In connection with the synthesis of chiral pyrethroids with high insecticidal activity, we investigated the use of dipeptides as catalysts to prepare enantiomeric α-cyanohydrins from aldehydes and hydrogen cyanide[1]. Conditions have now been developed for the preparation of α-cyanobenzylalcohols (1) in very high optical and chemical yield by using cyclo(phenylalanyl-histidine) dipeptides. Thus (R,R)-enantiomer of the peptide catalysed the formation of (S)-α-cyano-3-phenoxyphenzylalcohol in 89% yield and 99% enatiomeric excess. This alcohol was used in the synthesis of cyhalothrin (2), a pyrethroid insecticide.

The catalyst used in the process could be quantitatively precipitated and recrystallised and reused. Several structural analogues of the cyclic peptide were also prepared but they are less effective as catalysts.



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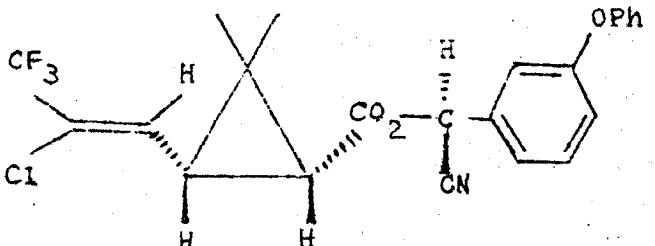

(2)

Reference

1. Oku,J. et al (1982) Makromol. Chem. 183 579.