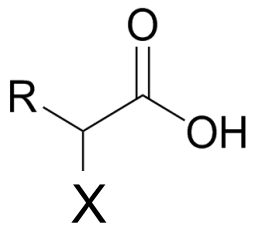
Claims

1. A method of selectively hydrolyzing the S-enantiomer of an alpha haloalkanoic acid according to formula I,



Formula I

wherein X is bromide or chloride and

R is an alkyl chain of 1 to 6 carbon atoms, wherein said alkyl chain is straight or branched at carbon atoms γ or δ,

comprising:

- providing a racemate of the R-enantiomer and the S-enantiomer of said alpha haloalkanoic acid,

- providing a polypeptide having dehalogenase activity comprising an amino acid sequence as set forth in SEQ ID NO. 1,

- reacting the racemate for 1-8 hours, wherein
  the pH is in the range of 9-10 and the temperature is in the range of 15-35°C for the polypeptide with dehalogenase activity comprising the amino acid sequence as set forth in SEQ ID NO. 1,
  and wherein an enantiomeric excess of the R-enantiomer of the alpha haloalkanoic acid of between 90.0% and 99.9% is reached after 1-8 hours, and wherein the concentration of the racemate of said alpha haloalkanoic acid according to Formula I is between 80 and 200 g/L and the polypeptide with dehalogenase activity is comprised within whole cells.

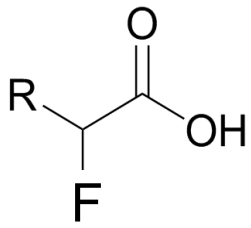
2. The method according to claim 1, wherein the ratio of racemate of the alpha haloalkanoic acid according to Formula I to biomass of whole cells comprising the polypeptide having dehalogenase activity comprising the amino acid sequence as set forth in SEQ ID NO. 1 or a sequence with at least 90% sequence identity to said sequence is between 2:1 to 15:1.

3. The method according to claim 1, wherein moiety R of said alpha haloalkanoic acid of formula I is chosen from the group consisting of ethyl, butyl, 2-methyl-propyl and methyl-

cyclopropyl.

4. The method according to claim 1 for selective hydrolysis of the S-enantiomer of said alpha haloalkanoic acid of formula I from a racemate, wherein the enantiomeric excess of the R-enantiomer of said alpha haloalkanoic acid is between 90.0% and 99.9%.

5. A method of selectively hydrolyzing the S-enantiomer of an alpha haloalkanoic acid according to formula II,



Formula II

wherein

R is an alkyl chain of 1 to 6 carbon atoms, wherein said alkyl chain is straight or branched at carbon atoms γ or δ, and F is a single fluorine atom,

said method comprising:

providing a racemate of the R-enantiomer and the S-enantiomer of said alpha haloalkanoic acid,

- providing a polypeptide having dehalogenase activity comprising an amino acid sequence as set forth in SEQ ID NO. 4,

- reacting the racemate for 1-8 hours, wherein the pH is in the range of 9-10 and the temperature is in the range of 55-65°C for the polypeptide with dehalogenase activity comprising the amino acid sequence as set forth in SEQ ID NO. 4,

wherein an enantiomeric excess of the R-enantiomer of the alpha haloalkanoic acid of between 90.0% and 99.9% is reached after 1-8 hours, and wherein the concentration of the racemate of said alpha haloalkanoic acid according to Formula II is between 80 and 200 g/L and the polypeptide with dehalogenase activity is comprised within whole cells.

6. The method according to claim 2, wherein the ratio is between 3:1 to 10:1.

7. The method according to claim 2, wherein the ratio is 4:1.

8. The method according to claim 1, wherein X is bromide.

9. The method according to claim 1, wherein X is chloride.

10. The method according to claim 3, wherein moiety R of said alpha haloalkanoic acid of formula I is ethyl.

11. The method according to claim 3, wherein moiety R of said alpha haloalkanoic acid of formula I is butyl.

12. The method according to claim 3, wherein moiety R of said alpha haloalkanoic acid of formula I is 2-methyl-propyl.

13. The method according to claim 3, wherein moiety R of said alpha haloalkanoic acid of formula I is methyl-cyclopropyl.