1. A process for preparing (-)-Ambrox or a mixture comprising (-)-Ambrox, wherein a mixture of isomers comprising (3E,7E)-homofarnesol (EEH) is enzymatically converted to (-)-Ambrox or a mixture comprising (-)-Ambrox wherein the enzymatic conversion is carried out using an squalene hopene cyclase/homofarnesol Ambrox cyclase (SHC/HAC) enzyme having the polypeptide sequenceSEQ ID No. 21 under reaction conditions suitable for the production of (-)-Ambrox, and wherein the mixture of isomers comprises homofarnesol isomers selected from one or more of the following groups consisting of [(3E,7E) and [(3Z,7E)] and/or [(3E,7E) and (3E,7Z)] and/or [(3Z,7E), (3E,7E) and (3E,7Z)] also designated as [EE:EZ], [EE:ZE] and [EE:EZ:ZE] respectively.

2. The process according to claim 1, wherein the process uses a recombinant host cell biocatalyst producing the SHC/HAC enzyme.

3. The process according to claim 1, wherein the conversion of homofarnesol to (-)-Ambrox takes place at a temperature in the range of from 30°C to 60°C, at a pH in the range of about 4-8.

4. The process according to claim 3, wherein the conversion of homofarnesol to (-)-Ambrox takes place at a temperature of about 34°C to about 50°C, at a pH in the range of about 5-6.2.

5. The process according to claim 2 further comprising sodium dodecyl sulfate (SDS), wherein the SDS/cell ratio is in the range of 10:1 to 20:1.

6. The process according to claim 2, wherein the weight ratio of biocatalyst to homofarnesol is in the range of from about 0.5-2:1.

7. The process according to claim 25, wherein the cell growth and bioconversion reaction steps are carried out in the same reaction vessel.

8. The process according to claim 1, wherein the homofarnesol substrate comprises two homofarnesol isomers.

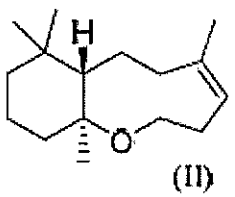
9. The process according to claim 8, wherein the homofarnesol substrate comprises EE:EZ isomers.

10. The process according to claim 1, wherein the homofarnesol comprises an EE:EZ isomer mixture in the weight ratios selected from the group consisting of: 100:00; 99:01; 98:02; 97:03; 96:04; 95:05; 94:06; 93:07; 92:08; 91:09; 90:10; 89:11; 88:12; 87:13; 86:14; 85:15; 84:16; 83:17; 82:18; 81:19; 80:20; 79:21; 78:22; 77:23; 76:24; 75:25; 74:26; 73:27; 72:28; 71:29 70:30; 69:31; 68:32; 67:33; 66:34; 65:35; 64:36; 63:37; 62:38; 61:39; and/or 60:40.

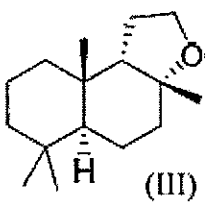
11. The process according to claim 1, wherein the homofarnesol comprises an EE:EZ isomer mixture in a weight ratio selected from the group consisting of: EE:EZ 92:08; EE:EZ 90:10; EE:EZ 80:20; EE:EZ 86:14; EE:EZ 70:30; EE:EZ 69:31; and/or EE:EZ 66:34.

12. The process according to claim 11 wherein the homofarnesol comprises EE:EZ isomer mixture in a weight ratio of 80:20.

13. The process according to claim 1, wherein (-)-Ambrox is produced in admixture with at least one or more of the by-products (II), (IV) and/or (III)



(II)



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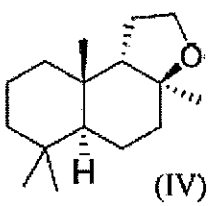


(IV)

14. The process according to claim 1, wherein (-)-Ambrox is isolated from the bioconversion reaction mixture using an organic solvent or a steam extraction/distillation step or filtration.

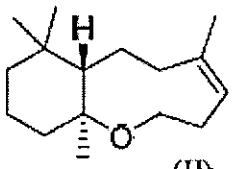
15. The process according to claim 1, wherein (-)-Ambrox is isolated from the solid phase of the bioconversion reaction mixture using an organic solvent or a steam extraction/distillation step.

16. The process according to claim 15, wherein the (-)-Ambrox is isolated from the reaction mixture using an organic solvent.

17. The process according to claim 16, wherein (-)-Ambrox is isolated from the reaction mixture using ethanol or toluene.

18. The process according to claim 17, wherein the (-)-Ambrox is selectively crystallized using an organic solvent.

19. The process according to claim 18, wherein the (-)-Ambrox is substantially free of the by-products (II), (IV) and/or (III)



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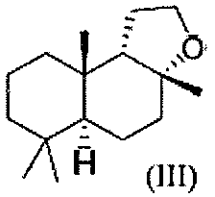

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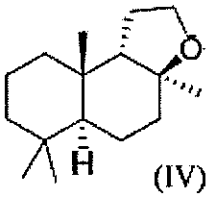

(IV)

20. The process according to claim 1, wherein (-)-Ambrox in a concentration range of about 125-200g/l is produced.

21. The process according to claim 4, wherein the conversion of homofarnesol to (-)-Ambrox takes place at a pH range of 5.0 to 6.2 and at a temperature of about 35°C.

22. The process according to claim 5, wherein the SDS/cell ratio is 16:1 when the ratio of biocatalyst to EEH is about 2:1.

23. The process according to claim 6, wherein the weight ratio of biocatalyst to homofarnesol is in the range of from about 1:1 or 0.5:1.

24. The process according to claim 2, wherein the process uses SDS with the recombinant host cells producing the SHC/HAC enzyme.

25. The process according to claim 2, wherein in a first step the recombinant cells grow and produce the SHC/HAC enzyme.