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CLAIMS

1. A process for producing squalene and/or sterol comprising lysing squalene and/or sterol containing yeast cells obtained by fermentation in a culture medium under batch conditions or under continuous conditions in a lysis medium, wherein the lysis medium comprises an aqueous suspension medium, an alkali or alkaline earth hydroxide and an organic lysis solvent, and wherein the lysis is performed in a closed system under elevated pressure of 2 to 50 bar (2 to 50x10^5 Pa) and at a temperature which is above the boiling point of the lysis medium at atmospheric pressure, wherein the lysis is performed under batch conditions or under continuous conditions.

2. The process according to claim 1, wherein the sterol is ergosterol or lanosterol.

3. The process according to any one of claims 1 to 2, wherein the alkali or alkaline earth hydroxide, in solid form or in aqueous solution, is potassium hydroxide (KOH), sodium hydroxide (NaOH), lithium hydroxide (LiOH), calcium hydroxide ($Ca(OH)_2$), magnesium hydroxide ($Mg(OH)_2$), caesium hydroxide (CsOH) or barium hydroxide ($Ba(OH)_2$)..

4. The process according to any one of claims 1 to 3, wherein the organic lysis solvent is a polar protic solvent.

5 The process according to any of claims 1 to 4, wherein the organic lysis solvent is ethanol, methanol, n-butanol, isopropanol or n-propanol.

6. The process according to any one of claims 1 to 5, wherein the temperature is at least 30°C above the boiling point of the lysis medium at atmospheric pressure.

7 The process according to claim 6, wherein the temperature is 140 to 250°C.

8. The process according to any one of claims 1 to 7, wherein lysis is effected at a pressure at 6 to 40 bar (6 to 40x10^5 Pa).

9. The process according to claim 6, wherein the temperature is 170 to 195°C.

10. The process according to any one of claims 1 to 9, wherein the lysis is effected within a time period of 1 to 140 minutes.

11. The process according to any one of claims 1 to 10, wherein the yeast cells are optionally separated from the culture medium and re-suspended in the lysis medium before lysis.

12. The process according to any one of claims 1 to 11, wherein the aqueous suspension medium is water or the culture medium for fermenting the yeast cells.

13. The process according to any one of claims 1 to 12, wherein
the aqueous suspension medium in the subsequent lysis is the culture medium,
the alkaline hydroxide is solid potassium hydroxide or potassium hydroxide solution,
the organic lysis solvent is ethanol, and
the lysis is performed under continuous conditions at a temperature of 140 to 250°C.

14. The process according to any one of claims 1 to 13, further comprising adding an organic extraction solvent to the lysis mixture, and isolating squalene and/or the sterol from the organic phase.

15. The process according to claim 14, wherein the organic extraction solvent is one or more non-polar solvents.

16. The process according to claim 14 or claim 15, wherein the organic extraction solvent is a halogenated or non-halogenated (i) alkane, (ii) cycloalkane, (iii) aromat, (iv) ketone, or (v) ether.

17. The process according to claim 16, wherein the organic extraction solvent is a non-halogenated alkane.

18. The process according to any of claims 14 to 17, wherein extraction is performed at a temperature of 40 to 140°C.

19. The process according to claim 18, wherein the extraction is performed at a temperature of 50 to 70°C.

20. The process according to any one of claims 14 to 19, wherein the isolation of the squalene and/or sterol comprises one or more of the following steps: cooling of the mixture; phase separation of organic extraction solvent phase comprising the squalene and/or sterol product from the aqueous suspension medium; distillation of the organic extraction solvent phase in order to evaporate the organic extraction solvent; distillation of the squalene and/or sterol.

CLAIMS

1. A process for producing squalene and/or sterol comprising
a) preparing squalene and/or sterol containing yeast cells by fermentation in a culture medium under batch conditions or under continuous conditions and
b) lysing the squalene and/or sterol containing yeast cells in a lysis medium,
wherein the lysis medium comprises an aqueous suspension medium,
an alkali or alkaline earth hydroxide and an organic lysis solvent,
and wherein the lysis is performed in a closed system under elevated pressure of 2 to 50 bar (2 to $50x10^5$ Pa) and at a temperature which is above the boiling point of the lysis medium at atmospheric pressure, wherein the lysis is performed under batch conditions or under continuous conditions.

2. The process according to claim 1, wherein the sterol is ergosterol or lanosterol.

3. The process according to any one of claims 1 to 2, wherein the alkali or alkaline earth hydroxide, added in solid form or in aqueous solution to the lysis medium, is potassium hydroxide (KOH), sodium hydroxide (NaOH), lithium hydroxide (LiOH), calcium hydroxide ($Ca(OH)_2$), magnesium hydroxide ($Mg(OH)_2$), caesium hydroxide (CsOH) or barium hydroxide ($Ba(OH)_2$).

4. The process according to any one of claims 1 to 3, wherein the organic lysis solvent is a polar protic solvent.

5 The process according to any of claims 1 to 4, wherein the organic lysis solvent is ethanol, methanol, n-butanol, isopropanol or n-propanol.

6. The process according to any one of claims 1 to 5, wherein the temperature is at least 30°C above the boiling point of the lysis medium at atmospheric pressure.

7 The process according to claim 6, wherein the temperature is 140 to 250°C.

8. The process according to any one of claims 1 to 7, wherein lysis is effected at a pressure at 6 to 40 bar (6 to $40x10^5$ Pa).

9. The process according to claim 6, wherein the temperature is 170 to 195°C.

10. The process according to any one of claims 1 to 9, wherein the lysis is effected within a time period of 1 to 140 minutes.

11. The process according to any one of claims 1 to 10, wherein the yeast cells are separated from the culture medium and re-suspended in the lysis medium before lysis.

12. The process according to any one of claims 1 to 11, wherein the aqueous suspension medium is water or the culture medium for fermenting the yeast cells.

13. The process according to any one of claims 1 to 12, wherein
the aqueous suspension medium in the subsequent lysis is the culture medium,
the alkaline hydroxide is solid potassium hydroxide or potassium hydroxide solution,
the organic lysis solvent is ethanol, and
the lysis is performed under continuous conditions at a temperature of 140 to 250°C.

14. The process according to any one of claims 1 to 13, further comprising adding an organic extraction solvent to the lysis mixture, and isolating squalene and/or the sterol from the organic phase.

15. The process according to claim 14, wherein the organic extraction solvent is one or more non-polar solvents.

16. The process according to claim 14 or claim 15, wherein the organic extraction solvent is a halogenated or non-halogenated (i) alkane, (ii) cycloalkane, (iii) aromat, (iv) ketone, or (v) ether.

17. The process according to claim 16, wherein the organic extraction solvent is a non-halogenated alkane.

18. The process according to any of claims 14 to 17, wherein extraction is performed at a temperature of 40 to 140°C.

19. The process according to claim 18, wherein the extraction is performed at a temperature of 50 to 70°C.

20. The process according to any one of claims 14 to 19, wherein the isolation of the squalene and/or sterol comprises one or more of the following steps: cooling of the mixture; phase separation of organic extraction solvent phase comprising the squalene and/or sterol product from the aqueous suspension medium; distillation of the organic extraction solvent phase in order to evaporate the organic extraction solvent; distillation of the squalene and/or sterol.