

CLAIMS

1. A method of extracting an aliphatic alcohol, preferably containing 5 to 16 carbon atoms, from an aqueous medium, the method comprising:
- 5 (a) contacting the aliphatic alcohol in the aqueous medium with at least one extracting medium for a time sufficient to extract the aliphatic alcohol from the aqueous medium into the extracting medium,
- (b) separating the extracting medium with the extracted aliphatic alcohol from the aqueous medium
- 10 wherein the extracting medium comprises:
- at least one trialkyl-phosphine-oxide, preferably trioctyl-phosphine-oxide, and optionally at least one alkane, and
- wherein the aliphatic alcohol is produced from a carbon source by contacting the carbon source with at least one microorganism capable of converting the carbon source to the
- 15 aliphatic alcohol.
2. The method according to claim 1, wherein the microorganism is:
- (i) a mixture of a first and a second microorganism and
- the first microorganism is an acetogenic microorganism capable of converting the
- 20 carbon source to acetate and/or ethanol; and
- the second microorganism is for carbon chain elongation and is selected from the group consisting of *Clostridium kluyveri*, and *C. Carboxidivorans* and is capable of converting the acetate and/or ethanol to form an acid; and
- wherein the first microorganism is further capable of converting the acid to the
- 25 corresponding aliphatic alcohol, or
- (ii) *C. Carboxidivorans* capable of converting the carbon source to the aliphatic alcohol.
3. The method according to any one of the preceding claims, wherein the alkane comprises 12 to 18 carbon atoms.
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4. The method according to any one of the preceding claims, wherein the alkane is hexadecane.
5. The method according to any one of the preceding claims, wherein the alkane is a
- 35 branched alkane.
6. The method according to any one of the preceding claims, wherein the aliphatic alcohol is selected from the group consisting of aliphatic alcohols with 4 to 16 carbon atoms.

7. The method according to any one of the preceding claims, wherein the aliphatic alcohol is a hexanol.
8. The method according to any one of the preceding claims, wherein the weight ratio of at least one trialkyl-phosphine-oxide, preferably trioctyl-phosphine-oxide, to alkane is between 1:100 to 1:10.
9. The method according to any one of the preceding claims, wherein the pH of the aqueous medium is maintained between 5.5 and 7.
10. The method according to any one of the preceding claims, wherein the extracting medium is recycled.
11. Use of at least one trialkyl-phosphine-oxide, preferably trioctyl-phosphine-oxide, and optionally at least one alkane for extracting an aliphatic alcohol from an aqueous medium wherein the alkane comprises at least 12 carbon atoms.
12. Use according to claim 11, wherein the alkane comprises 12 to 18 carbon atoms.
13. Use according to claim 11 or 12, wherein the alkane is hexadecane.
14. Use according to any one claims 11 to 13, wherein the aliphatic alcohol is selected from the group consisting of aliphatic alcohols with 5 to 16 carbon atoms.
15. Use according to any one of claims 11 to 14, wherein the aliphatic alcohol is a hexanol.