Claims

1. A process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol, wherein the process comprises:
   (a) Providing a stream S0 comprising 1-methoxypropan-2-ol, 2-methoxypropan-1-ol and water, and having a molar ratio of 1-methoxypropan-2-ol : 2-methoxypropan-1-ol in the range of from 1 : 5 to 5 : 1;
   (b) separating 1-methoxypropan-2-ol and 2-methoxypropan-1-ol from the stream S0 provided in (a) by distillation comprising subjecting the stream S0 provided in (a) to distillation conditions in a distillation unit comprising a distillation column B, obtaining a (top) stream S1 comprising 1-methoxypropan-2-ol, 2-methoxypropan-1-ol and water, which is enriched in 1-methoxypropan-2-ol and 2-methoxypropan-1-ol compared to the stream S0 and a bottoms stream S1a comprising water and being depleted of 1-methoxypropan-2-ol and 2-methoxypropan-1-ol compared to S0; wherein the distillation column B is operated at a pressure of ≥ 2 bar;
   (c.1) separation of the stream S1 obtained in (b) with at least one membrane unit M comprising at least one membrane module, obtaining a stream S2 which is depleted of water and further enriched in 1-methoxypropan-2-ol and 2-methoxypropan-1-ol compared to the stream S1, and a stream S2a comprising water;
   (c.2) subjecting the stream S2 obtained in (c.1) to distillation conditions in a distillation unit comprising a distillation column C, obtaining a stream S3, which is depleted of water and further enriched in 1-methoxypropan-2-ol and 2-methoxypropan-1-ol compared to the stream S2, and a stream S3a comprising water;
   (d) separating 1-methoxypropan-2-ol from the stream S3 obtained in (c.2) by distillation, comprising subjecting the stream S2 obtained in (c.2) to distillation conditions in a distillation unit comprising a distillation column D, obtaining a stream S5 comprising ≥ 95 weight-% 1-methoxypropan-2-ol and ≤ 0.5 weight-% of 2-methoxypropan-1-ol, based on the total weight of stream S5, and a stream S4 comprising ≥ 95 weight-% 2-methoxypropan-1-ol based on the total weight of stream S4;
   (e) optionally recirculating at least a part of the stream S3a to (c.1).

2. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to claim 1, wherein the thermal energy of stream S1 is partly transferred to a heat transfer medium stream HTMS1 after (b) and before step (c), preferably in a heat exchanger H, obtaining a heat transfer medium stream HTMS1a having an increased thermal energy content compared to HTMS1;
   - wherein HTMS1a is used to provide thermal energy to:
   - the membrane unit of (c.1), preferably to a heat exchanger of the membrane unit of (c.1);

   and/or
   - the distillation unit of step (c.2), preferably to a heat exchanger unit connected to the distillation column C of the distillation unit of (c.2),

   and/or

- the distillation unit of (d), preferably to a heat exchanger unit connected to the distillation column of the distillation unit of (d).

3. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to claim 2, wherein the thermal energy provided by HTMS1a provides at least 90 % of the energy demand of the membrane unit of (c.1), and/or of the distillation unit of (c.2),and/or of the distillation unit of (d), preferably the thermal energy provided by HTMS1a provides at least 95 % of the energy demand of the membrane unit of (c.1), and/or of the distillation unit of (c.2),and/or of the distillation unit of (d); more preferably the thermal energy provided by HTMS1a provides at least 98 %, more preferably at least 99 %, more preferably 100 %, of the energy demand of the membrane unit of (c.1), and/or of the distillation unit of (c.2),and/or of the distillation unit of (d).

4. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to claim 2 or 3, wherein in the range of from 40 to 95% of the thermal energy of stream S1 is transferred to the heat transfer medium stream HTMS1 obtaining a heat transfer medium stream HTMS1a having an increased thermal energy content compared to HTMS1.

5. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 4, wherein stream S0 provided in a) comprises water in an amount in the range of from 50 to 90 weight-%, preferably in the range of from 55 to 85 weight-% and a mixture of 1-methoxypropan-2-ol and 2-methoxypropan-1-ol in an amount in the range of from 8 to 50 weight-%, preferably in the range of from 13 to 45 weight-%, each based on the total weight of stream S0, the remaining amount up to 100 weight-% being other components (impurities and solvent (MeOH)).

6. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 5, wherein stream S0 provided in a) comprises 1-methoxypropan-2-ol and 2-methoxypropan-1-ol in a molar ratio in the range of from 1 : 4 to 4 : 1; preferably in the range of from 1 : 3 to 3 : 1, more preferred in the range of from 1 : 2 to 2 : 1, more preferred in the range of from 0.75 : 1 to 1 : 0.75.

7. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 6, wherein stream S0 provided in a) comprises propylene glycol dimethyl ether in an amount ≥ 0.001 weight-%, preferably in the range of from 0.001 to 0.1 weight-%, more preferred in the range of from 0.003 to 0.01 weight-%, more preferred in the range of from 0.004 to 0.01 weight-%, more preferred in the range of from 0.005 to 0.008 weight-%, based on the total weight of S0.

8. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 7, wherein the distillation column B comprised in the distillation unit according to b) is operated at a pressure in the range of from 2 to 30 bar, preferably in the range of from 2.5 to 20 bar, more preferred in the range of from 3 to 15 bar, more preferred in the range of from 3.5 to 14 bar, more preferred in the range of from 4 to 12 bar, more preferred in the range of from 5 to 11 bar.

9. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 8, wherein stream S1, which leaves distillation column B over the top, contains less than 0.05 weight-%, preferably less than 0.005 weight-%, more preferred less than 0.004 weight-%, more preferred less than 0.002 weight-%, of propylene glycol dimethyl ether, based on the total weight of S1.

10. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 9, wherein the membrane unit M according to (c.1) comprises one or more membrane modules, each membrane module comprising at least one membrane, and optionally one or more further component selected from the group consisting of heat exchanger, pump compressor and condenser.

11. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 10, wherein in step (e) at least 50 weight-% of S3a, preferably at least 60 weight-% of S3a, more preferred at least 70 weight-% of S3a, more preferred at least 80 weight-% of S3a, more preferred at least 90 weight-% of S3a, more preferred at least 95 weight-% of S3a, more preferred at least 99 weight-% of S3a, more preferred at least 99.5 weight-% of S3a, more preferred at least 100 weight-% of S3a, are recycled to the membrane unit M of (c.1).

12. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 11, wherein the stream S4 is removed as bottoms stream from distillation column D, wherein S4 comprises ≥ 95 weight-% 2-methoxypropan-1-ol and ≤ 0.5 weight- % 1-methoxypropan-2-ol, preferably ≥ 96 weight-% 2-methoxypropan-1-ol and ≤ 0.1 weight- % 1-methoxypropan-2-ol, more preferred ≥ 98 weight-% 2-methoxypropan-1-ol and ≤ 0.001 weight- % 1-methoxypropan-2-ol, more preferred ≥ 99 weight-% 2-methoxypropan-1-ol and ≤ 0.0001 weight- % 1-methoxypropan-2-ol, each based on the total weight of stream S4.

13. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 12,

wherein the stream S5 is removed as top stream from distillation column D, which comprises ≥ 95 weight-% 1-methoxypropan-2-ol and ≤ 0.5 weight- % of 2-methoxypropan-1-ol, preferably ≥ 98 weight-% 1-methoxypropan-2-ol and ≤ 0.15 weight- % of 2-methoxypropan-1-ol, more preferred ≥ 99 weight-% 1-methoxypropan-2-ol and ≤ 0.1 weight- % of 2-methoxypropan-1-ol, each based on the total weight of stream S5.

14. The process for separating 1-methoxypropan-2-ol from an aqueous stream comprising 1-methoxypropan-2-ol and 2-methoxypropan-1-ol according to any one of claims 1 to 13, wherein the stream S5 comprises ≤ 0.01 weight-%, preferably ≤ 0.008 weight-%, more preferred ≤ 0.007 weight-%, more preferred ≤ 0.006 weight-%, of propylene glycol dimethyl ether based on the total weight of stream S5.

~~15. 1-Methoxypropan-2-ol or a mixture of 1-methoxypropan-2-ol and 2-methoxypropan-1-ol obtained or obtainable from the process of any one of claims 1 to 14.~~