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) azeotropic distillation of the stream S1 obtained in (b) with an entrainer, comprising subjecting the stream S1 to azeotropic distillation conditions in an azeotropic distillation unit comprising a distillation column C, obtaining a bottoms 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 top stream S2a comprising water and the entrainer;
   (d) separating 1-methoxypropan-2-ol from the stream S2 obtained in (c) by distillation, comprising subjecting the stream S2 obtained in (c) to distillation conditions in a distillation unit comprising a distillation column D, obtaining a stream S3 comprising ≥ 95 weight-% 1-methoxypropan-2-ol and ≤ 0.5 weight-% of 2-methoxypropan-1-ol, based on the total weight of stream S3, and a stream S4 comprising ≥ 95 weight-% 2-methoxypropan-1-ol based on the total weight of stream S4;
   (e) optionally distillative separation of the stream S2a comprising water and the entrainer obtained in (c) in a steam stripping column E using steam as stripping agent, obtaining a stream S5 comprising the entrainer, which is depleted of water compared to the stream S2a, and an aqueous stream S6 being depleted of the entrainer compared to S2a; and optionally recirculating at least a part of the stream S5 to (c).

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 azeotropic distillation unit of step (c), preferably to a heat exchanger unit connected to the distillation column of the azeotropic distillation unit of (c),

   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 of the bottoms stream S1a of (b) is partly transferred to a heat transfer medium stream HTMS2, preferably in a heat exchanger H1, obtaining a heat transfer medium stream HTMS2a, which has an increased thermal energy content compared to HTMS2, wherein HTMS2a is used to provide thermal energy to the steam used as stripping agent in the steam stripping column of (e).

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 the thermal energy provided by HTMS1a provides at least 90 % of the energy demand of the azeotropic distillation unit of (c), 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 azeotropic distillation unit of (c), and/or of the distillation unit of (d); more preferred the thermal energy provided by HTMS1a provides at least 98 % of the energy demand of the azeotropic distillation unit of (c), and/or of the distillation unit of (d).

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 of ≥ 0.001 weight-%, more preferred ≥ 0.006 weight-%, more preferred in the range of from 0.001 to 0.1 weight-%, preferably 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 3.5 to 20 bar, more preferred in the range of from 4 to 20 bar, more preferred in the range of from >5 to 15 bar, more preferred in the range of from 5.5 to 15 bar, more preferred in the range of from 6 to 14 bar, more preferred in the range of from 7 to 12 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 ≥ 95 weight-% of stream S1, which leaves distillation column B over the top, consist of water,1-methoxypropan-2-ol and 2-methoxypropan-1-ol; wherein preferably stream S1 comprises water in a amount in the range of from 40 to 80 weight-%, preferably in the range of from 50 to 70 weight-%, more preferred in the range of from 55 to 65 weight-%; and a mixture of 1-methoxypropan-2-ol and 2-methoxypropan-1-ol in an amount in the range of from 20 to 60 weight-%, preferably in the range of from 30 to 50 weight-%, more preferred in the range of from 35 to 45 weight-%, each based on the total weight of stream S1, wherein preferably stream S1 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.

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 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.

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 the stream S3 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 S3; and/or wherein the stream S3 comprises less than 0.01 weight-%, preferably less than 0.008 weight-%, more preferred less than 0.007 weight-%, more preferred less than 0.006 weight-%, of propylene glycol dimethyl ether based on the total weight of stream S3.