Claims

1. A process for purifying a gas mixture comprising dinitrogen monoxide, at least comprising the steps of

   (A) treating a gas mixture G-0 comprising dinitrogen monoxide to obtain a gas mixture G-A, at least comprising the steps of

      (i) absorbing the gas mixture G-0 in a solvent mixture S-I to obtain an offgas stream and a composition C-A

      (ii) desorbing a gas mixture G-1 from the composition C-A to obtain a solvent mixture S-I'

   (B) condensing the gas mixture G-A to obtain a liquid composition C-1 comprising dinitrogen monoxide and a gaseous mixture G-K,

   wherein the gaseous mixture G-K is recycled into the treatment according to step (A).

2. The process for purifying a gas mixture comprising dinitrogen monoxide according to claim 1, wherein step (A) additionally comprises steps (iii) and (iv):

   (iii) absorbing the gas mixture G-1 in a solvent mixture S-II to obtain an offgas stream and a composition C-B

   (iv) desorbing a gas mixture G-2 from the composition C-B to obtain a solvent mixture S-II'.

3. The process for purifying a gas mixture comprising dinitrogen monoxide according to either of claims 1 and 2, wherein step (A) comprises further steps.

4. The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of claims 1 to 3, wherein the gaseous mixture G-K is recycled into step (i) or into step (iii) of step (A).

5. The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of claims 1 to 4, wherein the solvent mixture S-I or the solvent mixture S-II or the solvent mixture S-I and the solvent mixture S-II is/are

selected from the group consisting of organic solvents and aqueous solvent mixtures.

6. The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of claims 1 to 5, wherein from 20 to 90% by weight of the gas mixture G-A is condensed in step (B).

7. The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of claims 1 to 6, which comprises step (C):

(C) contacting the composition C-1 comprising dinitrogen monoxide with a gas mixture M-1 to obtain a composition C-2 and a gas mixture M-2.

8. The process for purifying a gas mixture comprising dinitrogen monoxide according to claim 7, wherein the gas mixture M-1 is selected from the group consisting of nitrogen, helium, neon, argon, krypton, xenon, hydrogen, carbon monoxide, methane and tetrafluoromethane.

9. The process for purifying a gas mixture comprising dinitrogen monoxide according to claims 7 or 8, wherein the gas mixture M-2 is recycled into step (A).

10. The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of claims 7 to 9, wherein the gas mixture M-2 is recycled into step (i) or into step (iii) of step (A).

Claims

[Claim 1]

A process for purifying a gas mixture comprising dinitrogen monoxide, comprising at least the following steps:

(A) treating a gas mixture G-0 comprising dinitrogen monoxide to obtain a gas mixture G-A, involving at least the steps of (i) absorbing the gas mixture G-0 in a solvent mixture LM-I to obtain an offgas stream and a composition Z-A and (ii) desorbing a gas mixture G-1 from the composition Z-A to obtain a solvent mixture LM-I', and

(B) condensing the gas mixture G-A to obtain a liquid composition Z-1 comprising dinitrogen monoxide and a gas mixture G-K,

wherein the gas mixture G-K is returned to the treatment according to step (A).

[Claim 2]

The process for purifying a gas mixture according to Claim 1, wherein step (A) further comprises steps (iii) and (iv):

(iii) absorbing the gas mixture G-1 into a solvent mixture LM-II to obtain an offgas stream and a composition Z-B; and

(iv) desorbing a gas mixture G-2 from the composition Z-B to obtain a solvent mixture LM-II'.

[Claim 3]

The process for purifying a gas mixture comprising dinitrogen monoxide according to Claim 1 or 2, wherein step (A) comprises further processes.

[Claim 4]

The process for purifying the gas mixture comprising dinitrogen monoxide according to any one of Claims 1 to 3, wherein the gas mixture G-K is returned to step (i) or step (iii) in step (A).

[Claim 5]

The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of Claims 1 to 4, wherein the solvent mixture LM-I or LM-II, or the solvent mixture LM-I and LM-II is/are selected from the group consisting of organic solvents and aqueous solvent mixtures.

[Claim 6]

The process for purifying the gas mixture comprising dinitrogen monoxide according to any one of Claims 1 to 5, wherein 20-90 mass% of the gas mixture G-A is condensed in step (B).

[Claim 7]

The process for purifying a gas mixture comprising dinitrogen monoxide according to any one of Claims 1 to 6, comprising step (C):

(C) bringing the composition Z-1 comprising dinitrogen monoxide into contact with a gas mixture S-1 to obtain a composition Z-2 and a gas mixture S-2.

[Claim 8]

The process for purifying a gas mixture comprising dinitrogen monoxide according to Claim 7, wherein the gas mixture S-1 is selected from the group consisting of nitrogen, helium, neon, argon, krypton, xenon, hydrogen, carbon monoxide, methane and tetrafluoromethane.

[Claim 9]

The process for purifying a gas mixture comprising dinitrogen monoxide according to Claim 7 or 8, wherein the gas mixture G-2 is returned to step (A).

[Claim 10]

The process for purifying the gas mixture comprising dinitrogen monoxide according to any one of

Claims 7 to 9, wherein the gas mixture S-2 is returned to step (i) or to step (iii) of step (A).