

Claims

1. Method for the control of pressure in a loop for the preparation of ammonia or methanol comprising the steps of
- 5 (a) providing a fresh ammonia or methanol synthesis gas;
(b) providing a loop recirculation gas;
(c) providing a loop recirculation compressor with an anti-surge valve and/or a compressor flow regulation valve;
(d) providing an ammonia or methanol synthesis loop;
- 10 (e) adding the fresh ammonia or methanol synthesis gas into the loop recirculation gas;
(f) pressurizing the loop recirculation gas from step (e) in the loop recirculation compressor; and
(g) monitoring pressure in the ammonia or methanol synthesis loop,
- 15 wherein flow of the loop recirculation gas through the anti-surge valve and/or the recirculation compressor flow regulation valve is controlled to obtain a substantially constant pressure in the ammonia or methanol synthesis
- 20 loop.
2. The method of claim 1, wherein compressor flow regulation valve is arranged in parallel with the antisurge valve.
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3. The method of claim 1 or 2, wherein flow of the fresh ammonia or methanol synthesis gas is controlled by an anti-surge valve of a compressor for the fresh synthesis gas.
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4. The method of any one of claims 1 to 3, comprising the further step of controlling temperature in a high-pressure

loop separator arranged in the loop for the preparation of ammonia or methanol.

5 5. The method of any one of claims 1 to 4, wherein hydrogen in the fresh ammonia or methanol synthesis gas is provided by means of electrolysis of water.

6. The method of claim 5, wherein the electrolysis of water is performed in a solid oxide electrolysis cell.

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7. The method of claim 1 to 4, wherein the fresh methanol synthesis gas is provided by co-electrolysis of water and carbon dioxide.

15 8. The method of any one of claims 1 to 6, wherein nitrogen in the fresh ammonia synthesis gas is provided by means of air separation.

9. The method of any one of claims 1 to 4, wherein the fresh ammonia synthesis gas is prepared of water and air in a solid oxide electrolysis cell.

10. The method of any one of claims 1 to 9, wherein flow of the loop recirculation gas is additionally controlled by a loop pressure controller downstream or upstream the recirculation compressor.

11. The method of any one of claims 1 to 10, wherein the module of the fresh ammonia synthesis gas is controlled by a ratio controller of hydrogen and nitrogen flow in ammonia synthesis gas by controlling the nitrogen flow rate relative to the hydrogen flow rate.

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12. The method of claim 11, wherein the ratio controller is compensated by a real-time analyzer.