CLAIMS

1. (amended) A process for producing acetic acid, which comprises

a reaction step for continuously allowing methanol to react with carbon monoxide in the presence of a catalyst system comprising a metal catalyst, an ionic iodide, and methyl iodide in a carbonylation reactor,

a flash distillation step for continuously feeding a flasher with a reaction mixture from the reactor and evaporating a volatile component at least containing product acetic acid, methyl acetate, and methyl iodide by flash distillation to separate the volatile component and a liquid catalyst mixture at least containing the metal catalyst and the ionic iodide, and

an acetic acid collection step for separating a stream containing acetic acid from the volatile component to collect acetic acid,

wherein the metal catalyst comprises a rhodium catalyst, and

in the flash distillation step, the flash distillation is conducted under the condition that the concentration of methyl acetate in the liquid catalyst mixture is not less than 0.6% by weight and the concentration of water in the liquid catalyst mixture is not more than 8% by weight.

2. A process according to claim 1, wherein the

concentration of methyl acetate in the liquid catalyst mixture is not less than 1% by weight.

3. A process according to claim 1 or 2, wherein the concentration of methyl acetate in the liquid catalyst mixture is not less than 1.5% by weight.

4. (amended) A process according to any one of claims 1 to 3, wherein the concentration of water in the liquid catalyst mixture is 0.8 to 8% by weight.

5. (amended) A process according to any one of claims 1 to 4, wherein the ionic iodide comprises an alkali metal iodide, and the concentration of the metal catalyst in the liquid catalyst mixture is not less than 300 ppm on the basis of weight.

6. A process according to any one of claims 1 to 5, wherein the concentration of acetic acid in the liquid catalyst mixture is not less than 40% by weight.

7. (amended) A process according to any one of claims 1 and 4 to 6, wherein, in the liquid catalyst mixture, the concentration of the ionic iodide is not more than 50% by weight, the concentration of methyl iodide is not more than 5% by weight, the concentration of acetic acid is 45 to 90% by weight, the concentration of methyl acetate is 0.6 to 3% by weight, and the concentration of water is 0.8 to 8% by weight.

8. (amended) A process according to any one of claims 1 and 4 to 7, wherein, in the liquid catalyst mixture, the concentration of the ionic iodide is not more than 40% by

weight, the concentration of methyl iodide is 0.01 to 4% by weight, the concentration of acetic acid is 50 to 85% by weight, the concentration of methyl acetate is 0.6 to 2% by weight, and the concentration of water is 0.8 to 4% by weight.

9. A process according to any one of claims 1 to 8, wherein, in the flash distillation step, the flash distillation is conducted at an absolute pressure of 0.1 to 0.5 MPa while maintaining the temperature of the liquid catalyst mixture at 100 to 170°C.

10. A process according to any one of claims 1 to 9, wherein the concentration of methyl acetate in the liquid catalyst mixture is adjusted by adding methyl acetate and/or a component producing methyl acetate to the reaction mixture and/or the flasher.

11. (amended) A method for inhibiting production of hydrogen iodide or increased concentration of hydrogen iodide in a flasher in a production process of acetic acid, the production process comprising

a reaction step for continuously allowing methanol to react with carbon monoxide in the presence of a catalyst system comprising a metal catalyst, an ionic iodide, and methyl iodide in a carbonylation reactor,

a flash distillation step for continuously feeding a flasher with a reaction mixture from the reactor and evaporating a volatile component at least containing product acetic acid, methyl acetate, and methyl iodide by flash

distillation to separate the volatile component and a liquid catalyst mixture at least containing the metal catalyst and the ionic iodide, and

an acetic acid collection step for separating a stream containing acetic acid from the volatile component to collect acetic acid,

wherein the metal catalyst comprises a rhodium catalyst, and

in the flash distillation step, the flash distillation is conducted under the condition that the concentration of methyl acetate in the liquid catalyst mixture is not less than 0.6% by weight and the concentration of water in the liquid catalyst mixture is not more than 8% by weight.

12. A process or method according to any one of claims 1 to 11, wherein the material of the flasher comprises a nickel-based alloy.

CLAIMS

1. A process for producing acetic acid, which comprises

a reaction step for continuously allowing methanol to react with carbon monoxide in the presence of a catalyst system comprising a metal catalyst, an ionic iodide, and methyl iodide in a carbonylation reactor,

a flash evaporation step for continuously feeding a flasher with a reaction mixture from the reactor and evaporating a volatile component at least containing product acetic acid, methyl acetate, and methyl iodide by flash evaporation to separate the volatile component and a liquid catalyst mixture at least containing the metal catalyst and the ionic iodide,

a recycling step for recycling the liquid catalyst mixture to the reactor, and

an acetic acid collection step comprising distilling and separating the volatile component into a lower boiling point fraction as a first overhead, a side stream containing acetic acid, and a higher boiling point fraction and distilling and separating the side stream into a lower boiling point component as a second overhead, and an acetic acid stream as a side or bottom stream for separating a stream containing acetic acid from the volatile component to collect acetic acid,

wherein the metal catalyst comprises a rhodium catalyst, and

in the flash evaporation step, the flash evaporation is conducted at a temperature of about 100 to 260° C. under an absolute pressure of about 0.03 to 1 MPa while maintaining the concentration of methyl acetate of about 0.6 to 15% by weight and the concentration of water of about 0.8 to 8% by weight in the liquid catalyst mixture.

2. A process according to claim **1**, wherein the concentration of methyl acetate in the liquid catalyst mixture is not less than 1% by weight.

3. A process according to claim **1**, wherein the concentration of methyl acetate in the liquid catalyst mixture is not less than 1.5% by weight.

4. A process according to claim **1**, wherein the concentration of water in the liquid catalyst mixture is about 0.8 to 4% by weight.

5. A process according to claim **1**, wherein the ionic iodide comprises an alkali metal iodide, and the concentration of the metal catalyst in the liquid catalyst mixture is not less than 300 ppm on the basis of weight.

6. A process according to claim **1**, wherein the concentration of acetic acid in the liquid catalyst mixture is not less than 40% by weight.

7. A process according to claim **1**, wherein, in the liquid catalyst mixture, the concentration of the ionic iodide is not more than 50% by weight, the concentration of methyl iodide is not more than 5% by weight, the concentration of acetic acid is 45 to 90% by weight, the concentration of methyl acetate is about 0.6 to 10% by weight, and the concentration of water is about 0.8 to 4% by weight.

8. A process according to claim **1**, wherein, in the liquid catalyst mixture, the concentration of the ionic iodide is not more than 40% by weight, the concentration of methyl iodide is 0.01 to 4% by weight, the concentration of acetic acid is 50 to 85% by weight, the concentration of methyl acetate is about 0.7 to 10% by weight, and the concentration of water is about 0.8 to 4% by weight.

9. A process according to claim **1**, wherein, in the flash evaporation step, the flash evaporation is conducted at an absolute pressure of about 0.1 to 0.5 MPa while maintaining the temperature of the liquid catalyst mixture at about 100 to 170° C.

10. A process according to claim **1**, wherein the concentration of methyl acetate in the liquid catalyst mixture is adjusted by adding methyl acetate and/or a component producing methyl acetate to the reaction mixture and/or the flasher.

11. A process or method according to claim **1**, wherein the material of the flasher comprises a nickel-based alloy.

12. A method for inhibiting production of hydrogen iodide or increased concentration of hydrogen iodide in a flasher in a production process of acetic acid, the production process comprising

a reaction step for continuously allowing methanol to react with carbon monoxide in the presence of a catalyst system comprising a metal catalyst, an ionic iodide, and methyl iodide in a carbonylation reactor,

a flash evaporation step for continuously feeding a flasher with a reaction mixture from the reactor and evaporating a volatile component at least containing product acetic acid, methyl acetate, and methyl iodide by flash evaporation to separate the volatile component and a liquid catalyst mixture at least containing the metal catalyst and the ionic iodide,

a recycling step for recycling the liquid catalyst mixture to the reactor, and

an acetic acid collection step comprising distilling and separating the volatile component into a lower boiling point fraction as a first overhead, a side stream contain-

ing acetic acid, and a higher boiling point fraction and distilling and separating the side stream into a lower boiling point component as a second overhead, and an acetic acid stream as a side or bottom stream for separating a stream containing acetic acid from the volatile component to collect acetic acid,

wherein the metal catalyst comprises a rhodium catalyst, and

in the flash evaporation step, the flash evaporation is conducted at a temperature of about 100 to 260° C. under an absolute pressure of about 0.03 to 1 MPa while maintaining the concentration of methyl acetate of about 0.6 to 15% by weight and the concentration of water of about 0.8 to 8% by weight in the liquid catalyst mixture.

13. A process or method according to claim **12**, wherein the material of the flasher comprises a nickel-based alloy.