Claims

1. Process for preparing a carboxamide from a carbonyl compound and hydrogen cyanide, comprising the steps of

A) reacting a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile,

B) hydrolysing the hydroxycarbonitrile obtained in step A) in the presence of a catalyst comprising manganese dioxide, wherein a molar excess of carbonyl compound in relation to the hydrogen cyanide is used for the reaction of the carbonyl compound with hydrogen cyanide in step A), and the reaction mixture obtained in step A) is not purified by distillation before the hydrolysis in step B) is performed, characterized in that the reaction mixture obtained after step B) is purified by a two-stage distillation in that the resulting carboxamide and water are separated from a mixture which comprises carbonyl compound and hydroxycarbonitrile and/or hydrogen cyanide, and water is separated from resulting carboxamide in a further distillation step.

2. Process according to Claim 1, characterized in that the molar ratio of carbonyl compound to hydrogen cyanide is in the range from 1.1:1 to 7:1.

3. Process according to Claim 2, characterized in that the molar ratio of carbonyl compound to hydrogen cyanide is in the range from 1.5:1 to 5:1.

4. Process according to Claim 1, characterized in that the carboxamide is separated from water in a multistage evaporative concentration.

5. Process according to at least one of Claims 1 to 4, characterized in that a composition which comprises the carbonyl compound used in step A) is introduced via the reflux into the still used to separate water and hydrogen cyanide, the composition introduced into the reflux having a lower proportion

of HCN than the composition withdrawn via the top of the still.

6. Process according to Claim 5, characterized in that the amount of carbonyl compound added is selected such that it is sufficient to prepare the amount of hydroxycarbonitrile envisaged in step A).

7. Process according to at least one of Claims 1 to 6, characterized in that the carbonyl compound obtained by the purification is used to prepare a hydroxycarbonitrile in step A).

8. Process according to at least one of the preceding claims, characterized in that the carbonyl compound used in step A) is acetone.

9. Process according to at least one of the preceding claims, characterized in that the reaction of a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile in step A) is performed at a temperature in the range from -10 to 50°C.

10. Process according to at least one of the preceding claims, characterized in that the reaction of a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile in step A) is performed at a pressure in the range from 0.3 bar to 3 bar.

11. Process according to at least one of the preceding claims, characterized in that the molar ratio of water to hydroxycarbonitrile in the hydrolysis in step B) is in the range of 0.5:1-25:1.

12. Process according to at least one of the preceding claims, characterized in that the hydrolysis reaction in step B) is performed at a temperature in the range from 10 to 150°C.

13. Process according to at least one of the preceding claims, characterized in that the hydrolysis reaction is performed at a pressure in the range from 0.1 bar to 10 bar.

14. Process for preparing alkyl (meth)acrylates, characterized in that a process for preparing a carboxamide from a carbonyl compound and hydrogen cyanide according to at least one of Claims 1 to 13 is performed in the course of the process for preparing alkyl (meth)acrylates.

15. Process according to Claim 14, characterized in that methyl methacrylate is prepared.

Claims

1. Process for preparing a carboxamide from a carbonyl compound and hydrogen cyanide, comprising the steps of

A) reacting a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile,

B) hydrolysing the hydroxycarbonitrile obtained in step A) in the presence of a catalyst comprising manganese dioxide, wherein a molar excess of carbonyl compound in relation to the hydrogen cyanide is used for the reaction of the carbonyl compound with hydrogen cyanide in step A), and the reaction mixture obtained in step A) is not purified by distillation before the hydrolysis in step B) is performed, characterized in that the reaction mixture obtained after step B) is purified by a two-stage distillation in that the resulting carboxamide and water are separated from a mixture which comprises carbonyl compound and hydroxycarbonitrile and/or hydrogen cyanide, and water is separated from resulting carboxamide in a further distillation step;

characterized in that a composition which comprises the carbonyl compound used in step A) is introduced via the reflux into the still used to separate water and hydrogen cyanide, the composition introduced into the reflux having a lower proportion of HCN than the composition withdrawn via the top of the still.

2. Process according to Claim 1, characterized in that the molar ratio of carbonyl compound to hydrogen cyanide is in the range from 1.1:1 to 7:1.

3. Process according to Claim 2, characterized in that the molar ratio of carbonyl compound to hydrogen cyanide is in the range from 1.5:1 to 5:1.

4. Process according to Claim 1, characterized in that the carboxamide is separated from water in a multistage evaporative concentration.

5. Process according to Claim 4, characterized in that the amount of carbonyl compound added is selected such that it is sufficient to prepare the amount of hydroxycarbonitrile envisaged in step A).

6. Process according to at least one of Claims 1 to 5, characterized in that the carbonyl compound obtained by the purification is used to prepare a hydroxycarbonitrile in step A).

7. Process according to at least one of the preceding claims, characterized in that the carbonyl compound used in step A) is acetone.

8. Process according to at least one of the preceding claims, characterized in that the reaction of a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile in step A) is performed at a temperature in the range from -10 to 50°C.

9. Process according to at least one of the preceding claims, characterized in that the reaction of a carbonyl compound with hydrogen cyanide to prepare a hydroxycarbonitrile in step A) is performed at a pressure in the range from 0.3 bar to 3 bar.

10. Process according to at least one of the preceding claims, characterized in that the molar ratio of water to hydroxycarbonitrile in the hydrolysis in step B) is in the range of 0.5:1-25:1.

11. Process according to at least one of the preceding claims, characterized in that the hydrolysis reaction in step B) is performed at a temperature in the range from 10 to 150°C.

12. Process according to at least one of the preceding claims, characterized in that the hydrolysis reaction is performed at a pressure in the range from

0.1 bar to 10 bar.

13. Process for preparing alkyl (meth)acrylates, characterized in that a process for preparing a carboxamide from a carbonyl compound and hydrogen cyanide according to at least one of Claims 1 to 12 is performed in the course of the process for preparing alkyl (meth)acrylates.

14. Process according to Claim 13, characterized in that methyl methacrylate is prepared.