

**AS ENCLOSED TO IPER**

5 We claim:

1. The use of lactams, aminocarboxylic acids or mixtures thereof as accelerant or cocatalyst in the production of polyamides from aminonitriles and water.
- 10 2. A use as claimed in claim 1, wherefor the lactams, aminocarboxylic acids or mixtures thereof are used in an amount of from 0.3 to 10% by weight, based on the aminonitrile quantity.
- 15 3. A use as claimed in claim 1 or 2, wherefor the lactams, aminocarboxylic acids or mixtures thereof are used together with metal oxide fixed bed catalysts.
4. A process for producing a polyamide by reaction of at least one aminonitrile with water, which comprises the following steps:
 - 20 (1) reacting at least one aminonitrile with water at a temperature from 90 to 400°C and a pressure from 0.1 to 35×10^6 Pa, which reaction can be carried out in the presence of a Brönsted acid catalyst selected from a beta-zeolite catalyst, a sheet-silicate catalyst or a titanium dioxide catalyst consisting of from 70 to 100% by weight of anatase and from 0 to 30% by weight of rutile and in
25 which up to 40% by weight of the titanium dioxide may be replaced by tungsten oxide, to obtain a reaction mixture,
 - (2) further reacting the reaction mixture at a temperature from 150 to 400°C and a
30 pressure which is lower than the pressure in step 1, which reaction can be carried out in the presence of a Brönsted acid catalyst selected from a beta-zeolite catalyst, a sheet-silicate catalyst or a titanium dioxide catalyst consisting of from 70 to 100% by weight of anatase and from 0 to 30% by weight of rutile and in which up to 40% by weight of the titanium dioxide may be replaced by tungsten oxide, the temperature and pressure being selected so
35 as to obtain a first gas phase and a first liquid or a first solid phase or a mixture of first solid and first liquid phase, and the first gas phase is separated from the first liquid or the first solid phase or from the mixture of first liquid and first solid phase, and



- (3) admixing the first liquid or the first solid phase or the mixture of first liquid and first solid phase with a gaseous or liquid phase comprising water at a temperature from 150 to 370°C and a pressure from 0.1 to 30×10^6 Pa, optionally in the presence of the above catalyst, to obtain a product mixture,

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wherein the reaction is carried out in at least one of steps (1) and (2) in the presence of lactams, aminocarboxylic acids or mixtures thereof in an amount of from 0.3 to 10% by weight, based on the amount of aminonitrile used.

- 10 5. A process as claimed in claim 4, which additionally comprises the following step:

- (4) postcondensing the product mixture at a temperature from 200 to 350°C and a pressure which is lower than the pressure of step 3, the temperature and pressure being selected so as to obtain a second, water- and ammonia-comprising gas phase and a second liquid or second solid phase or a mixture of second liquid and second solid phase, which each comprise the polyamide.

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6. A process for producing a polyamide by reaction of at least one aminonitrile with water, which comprises the following steps:

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- (1) reacting at least one aminonitrile with water at a temperature from 90 to 400°C and a pressure from 0.1 to 35×10^6 Pa, which reaction can be carried out in the presence of a Brönsted acid catalyst selected from a beta-zeolite catalyst, a sheet-silicate catalyst or a titanium dioxide catalyst consisting of from 70 to 100% by weight of anatase and from 0 to 30% by weight of rutile and in which up to 40% by weight of the titanium dioxide may be replaced by tungsten oxide, to obtain a reaction mixture,

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- (2) further reacting the reaction mixture at a temperature from 150 to 400°C and a pressure which is lower than the pressure in step 1, which reaction can be carried out in the presence of a Brönsted acid catalyst selected from a beta-zeolite catalyst, a sheet-silicate catalyst or a titanium dioxide catalyst consisting of from 70 to 100% by weight of anatase and from 0 to 30% by weight of rutile and in which up to 40% by weight of the titanium dioxide may be replaced by tungsten oxide, the temperature and pressure being selected so as to obtain a first gas phase and a first liquid or a first solid phase or a mixture of first solid and first liquid phase, and the first gas phase is separated from the first liquid or the first solid phase or from the mixture of first liquid and first solid phase, and

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- 5 (4) postcondensing the first liquid or the first solid phase or the mixture of first liquid and first solid phase at a temperature from 200 to 350°C and a pressure which is lower than the pressure of step 3, the temperature and pressure being selected so as to obtain a second, water- and ammonia-comprising gas phase and a second liquid or second solid phase or a mixture of second liquid and second solid phase, which each comprise the polyamide,

10 wherein the reaction is carried out in at least one of steps (1) and (2) in the presence of lactams, aminocarboxylic acids or mixtures thereof in an amount of from 0.3 to 10% by weight, based on the amount of aminonitrile used.

- 15 7. A process as claimed in any of claims 4 to 6, wherein the temperature and pressure in step 1 or in step 3 or in both step 1 and step 3 are selected so as to obtain a liquid or a solid phase or a mixture of liquid and solid phase and a gaseous phase, and the gaseous phase is separated off.

8. A process as claimed in any of claims 4 to 7, wherein the reaction of step 1 is carried out with a molar ratio of aminonitrile to water of from 1:1 to 1:30.

- 20 9. A process as claimed in any of claims 4 to 8, wherein 6-aminocapronitrile and caprolactam, aminocaproic acid or mixtures thereof are used.

- 25 10. A process as claimed in any of claims 4 to 9, wherein the lactams, aminocarboxylic acids or mixtures thereof are used in an amount of from 1.0 to 7.0 % by weight, based on the amount of aminonitrile used.