C L A I M S

1. A process for the production of an aqueous solution of a salt of a diamine and a diacid, comprising the step of feeding into a first reaction zone a feed stream comprising the diamine, a feed stream comprising the diacid and optionally further feed streams, the flow rates of the feed streams being adjusted so that the diacid/diamine molar ratio in an output stream leaving the first reaction zone is greater than 1.1, wherein the first reaction zone contains an aqueous medium and in that the flow rates of the feed streams are adjusted in response to a change in sound velocity and/or density of the aqueous medium in the first reaction zone.
2. The process according to claim 1, wherein the flow rates of the feed streams are adjusted so that the concentration of dissolved reactants in the stream leaving the first reaction zone ranges from 40 % to 70 % by weight.
3. The process according to claim 1, wherein the feed stream comprising the diacid contains solid diacid.
4. The process according to claim 1, wherein the diacid is fed into the first reaction zone simultaneously with the feed of the diamine and water or wherein the diacid is fed into the first reaction zone which already contains water and/or diamine.
5. The process according to claim 1, wherein the feed stream comprising the diamine contains an aqueous solution of the diamine, at a concentration of 10 % to 50 % by weight.
6. The process according to claim 1, comprising the further step of dissolving the diamine in water or diluting an aqueous solution of the diamine with water to obtain the feed stream comprising the diamine, wherein the concentration of the diamine in the feed stream is adjusted in response to a change in sound velocity and/or density of the aqueous medium in the first reaction zone.
7. The process according claim 1, comprising the further steps of
    - transferring the aqueous solution obtained in the first reaction zone into a second reaction zone; and
    - introducing into the second reaction zone a stream comprising diamine and optionally a stream comprising water so as to

obtain a diacid/diamine molar ratio in an output stream leaving the second reaction zone ranging from 0.9 to 1.1.

8. The process according to claim 7, wherein the flow rates of the streams fed into the second reaction zone are adjusted so that the concentration of dissolved reactants in the output stream leaving the second reaction zone ranges from 50 % to 70 % by weight.

9. The process according to claim 7, wherein the flow rates of the streams comprising diamine fed into the second reaction zone are adjusted in response to a change in pH of the solution in the second reaction zone.

10. The process according to claim 1, comprising the further steps of

- transferring the aqueous solution obtained in the second reaction zone into a third reaction zone; and
- introducing into the third reaction zone a stream comprising diamine and/or a stream comprising diacid and/or a stream comprising water so as to obtain a diacid/diamine molar ratio in an output stream leaving the third reaction zone ranging from 0.995 to 1.005.

11. The process according to claim 10, wherein the flow rates of the streams fed into the third reaction zone are adjusted so that the concentration of dissolved reactants in the stream leaving the third reaction zone ranges from 50 % to 70 % by weight.

12. The process according to claim 10, wherein the flow rates of the streams fed into the third reaction zone are adjusted in response to a change in pH and/or refractive index of the solution in the third reaction zone.

13. The process according to claim 1, wherein the process is carried out continuously.

14. The process according to claim 1, wherein the diamine comprises hexamethylenediamine and the diacid comprises adipic acid.

15. The process of claim 1, further comprising manufacturing a polyamide from the aqueous solution of a salt of a diamine and a diacid.