Claims

1. A process for producing adipic acid crystals from a solution of adipic acid, the process comprising at least one step of purification by crystallization and one step of separation and recovery of the adipic acid crystals, wherein the adipic acid crystals are subjected, before the separation and recovery step, to a grinding phase.

2. The process according to claim 1, wherein the step of purification by crystallization and of separation and recovery of the adipic acid crystals comprises the following steps:
- a crystallization phase in a crystallizer optionally comprising an external circulation loop of a crystallization medium, by cooling and/or by concentrating a solution of adipic acid;
- optionally a phase of separation of the crystals formed;
- optionally a phase of repulping the crystals in a liquid medium saturated with adipic acid;
- a phase of separation and recovery of the crystals, optionally with washing of the crystals;
and in that
- when a single step of purification by crystallization and of separation and recovery of the adipic acid crystals is used, the grinding phase, before the phase of separation and recovery of the crystals, is carried out on at least one of the following media:
    - on a suspension of crystals in the crystallizer and circulating in the optional loop external to the crystallizer with recycling of this suspension comprising the ground crystals into the crystallizer;
    - on crystals in a medium of the optional repulping phase;
    - on wet crystals after the optional repulping phase;
- when at least two successive steps of purification by crystallization and of separation and recovery of the adipic acid crystals are carried out, the grinding phase, before the phase of separation and recovery of the crystals, is carried out, at least any one of the steps preceding the last step of purification by crystallization and of separation and recovery of the adipic acid crystals and/or during the last step of purification by crystallization and of separation and recovery of the adipic acid crystals, on at least one of the following media:
    - on the suspension of crystals contained in the crystallizer and circulating in the optional loop external to the crystallizer with recycling of this suspension containing the ground crystals into the crystallizer;
    - on the crystals contained in the medium of the optional repulping phase;
    - on the wet crystals after the optional repulping phase.

3. The process according to claim 1, wherein the solution of adipic acid is an aqueous solution of adipic acid.

4. The process according to claim 3, wherein the adipic acid is synthesized by nitric acid oxidation of a cyclohexanol/cyclohexanone mixture or of cyclohexanol.

5. The process according to claim 3, wherein the adipic acid is synthesized by oxidation of cyclohexane with molecular oxygen.

6. The process according to claim 1, wherein the process comprises at least two successive steps of purification by crystallization of the adipic acid.

7. The process according to claim 6, wherein the first step of purification by crystallization comprises:

- a phase of crystallization in a crystallizer by cooling and/or concentrating a solution of adipic acid;
- a phase of separation of the crystals formed;
- a phase of repulping of the crystals in a liquid medium saturated with adipic acid;
- a phase of separation and recovery of the crystals, with optional washing of the crystals; and
- the grinding phase being carried out on the crystals before the phase of separation and recovery of the crystals.

8. The process according to claim 7, wherein the grinding phase of the crystals is carried out on the crystals contained in the repulping medium.

9. The process according to claim 7, wherein the grinding phase of the crystals is carried out on the wet crystals before or after the repulping phase.

10. The process according to claim 7, wherein the grinding of the adipic acid crystals is carried out on the suspension of crystals in the crystallizer and circulating in a loop external to the crystallizer with recycling of this suspension comprising the ground crystals into the crystallizer.

11. The process according to claim 7, wherein the grinding phase of the crystals is carried out on the crystals recovered after a first repulping phase then a first phase of separation by filtration, said ground crystals then being subjected to a new repulping phase before being recovered in the separation and recovery phase.

12. The process according to claim 1, wherein the separation and recovery of the crystals is carried out by filtration or centrifugal drying.

13. The process according to claim 1, wherein the separated crystals are subjected to one or more washing operations.

14. The process according to claim 1, wherein the grinding of the crystals is carried out by mechanical agitation, pounding and crushing.