Claims

1. A process for preparation of methacrylic acid, comprising process steps

   a) providing a crude methacrylic acid-comprising aqueous solution comprising at least one aromatic acid impurity at least partially dissolved therein;

   b) precipitation of at least a part of the at least one aromatic acid impurity from the crude methacrylic acid-comprising aqueous solution to form at least one solid aromatic acid impurity and a mother liquor;

   c) separation of at least a part of the at least one solid aromatic acid impurity from the mother liquor to obtain a purified methacrylic acid-comprising aqueous solution and a solid aromatic acid impurity;

   d) separation of methacrylic acid from the purified methacrylic acid-comprising aqueous solution;

2. The process according to claim 1, wherein process step a) comprises process steps:

   a1) gas phase oxidation of a C_4 compound to obtain a methacrylic acid-comprising product gas;

   a2) contacting the methacrylic acid-comprising product gas with a quenching agent to obtain a crude methacrylic acid-comprising aqueous solution comprising at least one aromatic acid impurity at least partially dissolved therein.

3. A process according to claim 1 or claim 2, wherein the crude methacrylic acid-comprising aqueous solution is provided to step b) at a temperature in the range from 10 to less than 55 °C.

4. The process according to any one of the preceding claims, wherein in step b) the precipitation is at least partially carried out with agitation of the crude methacrylic acid-comprising aqueous solution.

5. The process according to any one of the preceding claims, wherein in step b) at least a part, preferably more than 30 wt.% of the crude methacrylic acid-comprising aqueous solution, based on the total weight of the crude methacrylic acid-comprising aqueous solution, is introduced into a first precipitation area.

6. The process according to any one of the preceding claims, wherein in step b) a precipitation seed is provided to the crude methacrylic acid-comprising aqueous solution.

7. The process according to claim 6, wherein at least 50 wt.% of the precipitation seed has a particle size in the range from 1 to 200 µm, measured by a method described by ISO 13320-1:1999(E).

8. The process according to any one of claims 6 or 7, wherein the providing of the precipitation seed to the crude methacrylic acid-comprising aqueous solution occurs with agitation to form a precipitation mixture.

9. The process according to any one of claims 6 to 8, wherein the precipitation seed is at least partially pre-formed in a second precipitation area before being provided to the crude methacrylic acid-comprising aqueous solution.

10. The process according to claim 9, wherein the precipitation seed is provided to the crude methacrylic acid-comprising aqueous solution via a side outlet at the second precipitation area.

11. The process according to any one of claims 6 to 10, wherein the precipitation seed is provided to the crude methacrylic acid-comprising aqueous solution in the first precipitation area.

12. The process according to any one of claims 8 to 11, wherein at least a part of the precipitation mixture is conducted to the second precipitation area.

13. The process according to claim 12, wherein the at least a part of the precipitation mixture is conducted to the second precipitation area via a side outlet at the first precipitation area.

14. The process according to any one of the preceding claims, wherein in step b) a further cooling occurs, preferably a cooling of the precipitation mixture in the second precipitation area.

15. The process according to any one of the preceding claims, wherein in step c) a stream comprising at least a part of the solid aromatic acid impurity exits the second precipitation

area via an outlet arranged in a lower region of the second precipitation area and is conducted to a separation area.

16. The process according to any one of the preceding claims, wherein the aromatic acid is terephthalic acid.