CLAIMS

What is claimed is:

1. A process for purifying methionine, wherein

methionine is separated from a salt by-product by using a macroporous adsorption resin, in which the methionine is adsorbed onto the macroporous adsorption resin, and then the methionine is recovered by desorbing from the resin using a desorbent; and the salt by-product is not absorbed onto the macroporous adsorption resin during the adsorption process, but enters an effluent resulting from the adsorption, the process mainly comprising the following steps:

1) flowing a methionine solution, from the top to the bottom, through a macroporous adsorption resin layer, and stopping resin adsorption when the content of methionine in an effluent from the resin column is greater than or equal to 10% (w/w) of the content at an inlet, in which the effluent resulting from the resin adsorption is a salt by-product;

2) resin desorption: desorbing, from the top to the bottom, the resin that has completed the adsorption in step 1) using a desorbent, and collecting the desorption solution; and

3) subsequent process: subjecting the desorption solution to subsequent treatments following an existing process.

2. The process for purifying methionine according to claim 1, wherein methionine is selected from methionine and a hydroxyl derivative of methionine.

3. The process for purifying methionine according to claim 1, wherein the salt by-product is one of sodium carbonate, sodium sulfate, ammonium sulfate, potassium carbonate, ammonium carbonate, or potassium sulfate, or a mixture of two or more thereof.

4. The process for purifying methionine according to claim 1, wherein in the resin adsorption of step 1), the methionine solution to be adsorbed is adjusted to pH 1.0-10.0.

5. The process for purifying methionine according to claim 4, wherein in the resin adsorption of step 1), the methionine solution to be adsorbed is adjusted to pH 1.0-5.0.

6. The process for purifying methionine according to claim 5, wherein in the resin adsorption of step 1), the methionine solution to be adsorbed is adjusted to pH 2.0-3.0.

7. The process for purifying methionine according to claim 1, wherein the methionine solution is flowed through the macroporous adsorption resin layer at a flow rate of 1-10 BV/h.

8. The process for purifying methionine according to claim 7, wherein the methionine solution is flowed through the macroporous adsorption resin layer at a flow rate of 1-5 BV/h.

9. The process for purifying methionine according to claim 8, wherein the methionine solution is flowed through the macroporous adsorption resin layer at a flow rate of 1-3 BV/h.

10. The process for purifying methionine according to claim 1, wherein the desorbent is selected from sodium hydroxide, potassium hydroxide, acetic acid, acetonitrile, sulfuric acid, nitric acid, bromohydric acid, hydrochloric acid, sodium chloride, aqueous ammonia, methanol, ethanol, i-propanol, isobutanol, ethyl acetate and acetone.

11. The process for purifying methionine according to claim 1, wherein the concentration of the desorbent is 1-50% (w/w).

12. The process for purifying methionine according to claim 11, wherein the concentration of the desorbent is 1-30% (w/w).

13. The process for purifying methionine according to claim 12, wherein the concentration of the desorbent is 2-25% (w/w).

14. The process for purifying methionine according to claim 1, wherein the volume of the desorbent for the resin is 1-10 BV.

15. The process for purifying methionine according to claim 1, wherein the flow rate of the desorbent for the resin is 1-10 BV/h.

16. The process for purifying methionine according to claim 1, wherein

the salt by-product is one of sodium carbonate, sodium sulfate, ammonium sulfate, potassium carbonate, or potassium sulfate, or a mixture of two or more thereof;

in the resin adsorption of step 1), the methionine solution to be adsorbed is adjusted to

pH 1.0-3.0; and then the methionine solution is flowed through the macroporous adsorption resin layer at a flow rate of 1-10 BV/h;

the desorbent is selected from sodium hydroxide, potassium hydroxide, hydrochloric acid, sodium chloride, aqueous ammonia, methanol, ethanol, i-propanol, and acetone;

the concentration of the desorbent is 2-25% (w/w);

the volume of the desorbent for the resin is 1-3 BV; and

the flow rate of the desorbent for the resin is 1-5 BV/h.

17. The process for purifying methionine according to claim 1, comprising the following steps:

1) resin adsorption: flowing a methionine solution (pH 1,5) with a methionine content of 2.98% (w/w) and an ammonium sulfate content of 41.59% (w/w) evenly, from the top to the bottom, through a macroporous adsorbing resin at a flow rate of 1 BV/h, collecting an effluent from the resin column separately, and stopping feeding to the resin column when the methionine content in the effluent from the bottom of the resin column is 0.3%;

2) resin desorption: desorbing, from the top to the bottom, the resin using 3 BV of 12% aqueous ammonia solution at a flow rate of 1 BV/h, and collecting the desorption solution. This desorbing solution is collected and send back to the methionine process with improvement of recycling yield, economical balance, environmental footprint and a simplification of the process;

3) the resin is regenerated by washing step and prepared for new adsorption with adsorbed solution.