CLAIMS

1. A method for recovering a solvent and an unreacted material in a finisher for a polyolefin elastomer preparation process, the method comprising:

a first step of injecting water into a finisher (14) to vaporize the water at a temperature between 130°C and 250°C, and a pressure less than 1 atm, thereby removing a solvent and an unreacted material from a polyolefin elastomer;

a second step of liquefying all of flow (201) vaporized in the finisher (14);

a third step of separating the liquefied flow into water and hydrocarbons by using a liquid-liquid separator (30);

a fourth step of removing moisture in the separated hydrocarbons through an adsorption column (10); and

a fifth step of transferring the hydrocarbons from which the moisture is removed to a distillation column (15).

2. The method of claim 1, wherein the second step comprises the steps of:

cooling the flow (201) vaporized in the finisher (14);

pressurizing flow (202) cooled by using a first compressor (21);

cooling flow (203) pressurized by the first compressor (21), and supplying the cooled flow to a first gas-liquid separator (23);

heating gas phase flow (205) of the first gas-liquid separator (23), and pressurizing liquid phase flow (209);

pressurizing, by using a second compressor (26), flow (206) separated by the first gas-liquid separator (23) and heated;

cooling flow (207) pressurized by the second compressor (26), and supplying the cooled flow to a second gas-liquid separator (28);

removing ethylene and ethane components having relatively low boiling points of the second gas-liquid separator (28) by gas phase flow (212), and pressurizing liquid phase flow (211) having a higher boiling point than the ethylene and ethane components; and

supplying flow (210) separated by the first gas-liquid separator (23) and pressurized and flow separated by second gas-liquid separator (28) and pressurized to the liquid-liquid separator (30).

3. The method of claim 1, wherein the second step comprises the steps of:

liquefying, by using one or more heat exchangers (20), the flow (201) vaporized in the finisher (14); and

pressurizing the liquefied flow (203) and supplying the pressurized flow to the liquid-liquid separator (30).

4. The method of claim 1, wherein one or more compressors or blowers are used to pressurize the flow (201) vaporized in the finisher (14).

5. The method of claim 1, wherein in the third step, when operating at a pressure higher than atmospheric pressure, or operating at a pressure below atmospheric pressure to suppress air inflow when separating water and hydrocarbons, a sealed liquid-liquid separator or a three-phase separator (gas-liquid-liquid separator) is used as the liquid-liquid separator (30).

6. The method of claim 5, wherein when the sealed liquid-liquid separator or the gas-liquid-liquid separator is used, an inert gas is injected to suppress the air inflow.

7. The method of claim 1, wherein at the time of the introduction into the liquid-liquid separator (30), heating is performed to prevent water from freezing.

8. The method of claim 7, wherein a component having a relatively low boiling point is removed by gas phase flow by using a gas-liquid-liquid separator as the liquid-liquid separator (30).

9. The method of claim 1, wherein flow (214) in which the water separated from the liquid-liquid separator (30) is rich is recirculated (2) to the finisher after solids of the flow are removed with a filter.

10. The method of claim 1, wherein the adsorption column (10) comprises at least one of molecular sieve, zeolite, and silica gel as an adsorbent.