CLAIMS

1. A method for producing ethylene carbonate comprising obtaining a reaction solution containing ethylene carbonate by reacting carbon dioxide and ethylene oxide in the presence of a catalyst and purifying ethylene carbonate by means of crystallization, the method comprising extracting a solution containing the catalyst from the reaction solution, adding water to the extracted solution in an amount of not less than 20 times by weight an amount of the catalyst dissolved in the extracted solution to deposit undissolved matters, removing the deposited undissolved matters from the extracted solution, and then circulating the resultant solution to the reaction solution.

2. The method according to claim 1, wherein the solution containing the catalyst is a part of an outlet solution obtained from a reactor for reacting carbon dioxide and ethylene oxide to produce ethylene carbonate.

3. A method for producing ethylene glycol comprising obtaining a reaction solution containing ethylene carbonate and ethylene glycol by reacting carbon dioxide, ethylene oxide, and water in the presence of a catalyst, and converting ethylene carbonate to ethylene glycol by further adding water to the obtained reaction solution, the method comprising extracting a solution containing the catalyst from the reaction solution, adding water to the extracted solution in an amount of not less than 20 times by weight an amount

of the catalyst dissolved in the extracted solution to deposit undissolved matters, removing the deposited undissolved matters from the extracted solution, and then circulating the resultant solution to the reaction solution.

4. The method according to claim 3, wherein the solution containing the catalyst is a part of an outlet solution obtained from a reactor for reacting carbon dioxide, ethylene oxide, and water to produce ethylene carbonate and ethylene glycol and/or a part of an outlet solution obtained from a reactor for converting ethylene carbonate to ethylene glycol by adding water to the obtained reaction solution.

5. The method according to any one of claims 1 to 4, wherein the undissolved matters are removed by means of static separation, filtrating separation, or adsorptive removal with an adsorptive substance.

6. The method according to any one of claims 1 to 5, wherein the catalyst is quaternary phosphonium iodide or bromide.

7. An ethylene carbonate which has a Hazen number of not more than 10 in relation to a color and which has a purity of not less than 99.999%.

8. A non-aqueous electrolyte solution which contains the ethylene carbonate as defined in claim 7.

CLAIMS

1. A method for producing ethylene carbonate comprising obtaining a reaction solution containing ethylene carbonate by reacting carbon dioxide and ethylene oxide in the presence of a catalyst and purifying ethylene carbonate by means of crystallization, the method comprising extracting a solution containing the catalyst from the reaction solution, adding water to the extracted solution in an amount of not less than 20 times by weight an amount of the catalyst dissolved in the extracted solution to deposit undissolved matters, removing the deposited undissolved matters from the extracted solution, and then circulating the solution containing the catalyst from which the undissolved matter has been removed to the reaction solution.

2. The method according to claim 1, wherein the solution containing the catalyst is a part of an outlet solution obtained from a reactor for reacting carbon dioxide and ethylene oxide to produce ethylene carbonate.

3. A method for producing ethylene glycol comprising obtaining a reaction solution containing ethylene carbonate and ethylene glycol by reacting carbon dioxide, ethylene oxide, and water in the presence of a catalyst, and converting ethylene carbonate to ethylene glycol by further adding water to the obtained reaction solution, the method comprising extracting

a solution containing the catalyst from the reaction solution, adding water to the extracted solution in an amount of not less than 20 times by weight an amount of the catalyst dissolved in the extracted solution to deposit undissolved matters, removing the deposited undissolved matters from the extracted solution, and then circulating the solution containing the catalyst from which the undissolved matter has been removed to the reaction solution.

4. The method according to claim 3, wherein the solution containing the catalyst is a part of an outlet solution obtained from a reactor for reacting carbon dioxide, ethylene oxide, and water to produce ethylene carbonate and ethylene glycol and/or a part of an outlet solution obtained from a reactor for converting ethylene carbonate to ethylene glycol by adding water to the obtained reaction solution.

5. The method according to claim 1 or 2, wherein the undissolved matters are removed by means of static separation, filtrating separation, or adsorptive removal with an adsorptive substance.

6. The method according to claim 3 or 4, wherein the undissolved matters are removed by means of static separation, filtrating separation, or adsorptive removal with an adsorptive substance.

7. The method according to claim 1, 2 or 5, wherein the catalyst is quaternary phosphonium iodide or bromide.

8. The method according to claim 3, 4 or 6, wherein the catalyst is quaternary phosphonium iodide or bromide.