CLAIMS

1. A method for producing an aromatic nitrile compound, comprising:

a dehydration reaction of dehydrating an aromatic amide compound;

wherein the dehydration reaction uses a solvent comprising one or a plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene,

wherein the dehydration reaction is performed in a state where the solvent is boiled,

wherein the aromatic amide compound at least comprises pyridine carboamide, and the aromatic nitrile compound at least comprises cyanopyridine,

wherein the dehydration reaction uses a catalyst comprising cesium, and

wherein a total amount of the one or the plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene is 40% by weight or greater with respect to the solvent.

2. The method for producing an aromatic nitrile compound according to claim 1, wherein the solvent is formed of only the one or the plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene.

3. The method for producing an aromatic nitrile compound according to claim 1, wherein the solvent is a mixed solvent further comprising a compound having a boiling point that is higher than the boiling point of the aromatic nitrile compound and the boiling point of water and is lower than the boiling point of the aromatic amide compound.

4. The method for producing an aromatic nitrile compound according to any one of claims 1 through 3, wherein the solvent is used in an amount larger than, or equal to, an equimolecular amount of the aromatic amide compound.

5. The method for producing an aromatic nitrile compound according to any one of claims 1 through 4, wherein the dehydration reaction is performed under the condition of normal pressure or a reduced pressure.

6. The method for producing an aromatic nitrile compound according to any one of claims 1 through 5, wherein a reaction solution of the dehydration reaction has a temperature of 170°C or higher and lower than 230°C.

7. The method for producing an aromatic nitrile compound according to any one of claims 1 through 6, wherein the aromatic amide compound is pyridine carboamide, and the aromatic nitrile compound is cyanopyridine.

8. The method for producing an aromatic nitrile compound according to any one of claims 1 through 7, wherein the dehydration reaction uses a catalyst comprising Cs_2O/SiO_2.

9. A method for producing an aromatic nitrile compound, comprising:

a dehydration reaction of dehydrating an aromatic amide compound;

wherein the dehydration reaction uses a solvent comprising one or a plurality of substances selected from 1,2,3,4-tetrahydronaphthalene, 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene, and a catalyst comprising cesium,

wherein the dehydration reaction is performed in a state where the solvent is boiled,

wherein the aromatic amide compound at least comprises pyridine carboamide, and the aromatic nitrile compound at least comprises cyanopyridine, and

wherein a total amount of the one or the plurality of substances selected from 1,2,3,4-tetrahydronaphthalene, 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene is 40% by weight or greater with respect to the solvent.

10. A method for producing a carbonate ester, comprising:

a first reaction step including a carbonate ester generation reaction of reacting an alcohol and carbon dioxide in the presence of an aromatic nitrile compound to generate a carbonate ester and water, and a hydration reaction of hydrating the aromatic nitrile compound with the generated water to generate an aromatic amide compound; and

a second reaction step of, after the aromatic amide compound is separated from a reaction system of the first reaction step, regenerating the aromatic amide compound into an aromatic nitrile compound by a dehydration reaction of dehydrating the aromatic amide compound in a solvent comprising one or a plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene;

wherein at least a part of the aromatic nitrile compound regenerated in the second reaction step is used in the first reaction step,

wherein the dehydration reaction is performed in a state where the solvent is boiled,

wherein the aromatic amide compound at least comprises pyridine carboamide, and the aromatic nitrile compound at least comprises cyanopyridine,

wherein the dehydration reaction uses a catalyst comprising cesium,

wherein the carbonate ester generation reaction uses a catalyst comprising cerium and

wherein a total amount of the one or the plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene is 40% by weight or greater with respect to the solvent.

11. The method for producing an aromatic nitrile compound according to claim10, wherein the solvent is formed of only the one or the plurality of substances selected from 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene.

12. The method for producing a carbonate ester according to claim 10 wherein the solvent is a mixed solvent further comprising a compound having a boiling point that is higher than the boiling point of the aromatic nitrile compound and the boiling point of water and is lower than the boiling point of the aromatic amide compound.

13. The method for producing a carbonate ester according to any one of claims 10 through 12, wherein the solvent is used in an amount larger than, or equal to, an equimolecular amount of the aromatic amide compound.

14. The method for producing a carbonate ester according to any one of claims 10 through 13, wherein the dehydration reaction is performed under the condition of normal pressure or a reduced pressure.

15. The method for producing a carbonate ester according to any one of claims 10 through 14, wherein a reaction solution of the dehydration reaction has a temperature of 170°C or higher and lower than 230°C.

16. The method for producing a carbonate ester according to any one of claims 10 through 15, wherein the aromatic amide compound is pyridine carboamide, and the aromatic nitrile compound is cyanopyridine.

17. The method for producing a carbonate ester according to any one of claims 10 through 16, wherein the dehydration reaction uses a catalyst comprising Cs_2O/SiO_2 .

18. The method for producing a carbonate ester according to any one of claims 10 through 17, wherein the carbonate ester generation reaction uses a catalyst comprisingCeO_2 .

19. The method for producing a carbonate ester according to any one of claims 10 through 18, wherein the alcohol comprises an alcohol having a carbon number of 1 to 6.

20. A method for producing a carbonate ester, comprising:

a first reaction step including a carbonate ester generation reaction of reacting an alcohol and carbon dioxide in the presence of an aromatic nitrile compound to generate a carbonate ester and water, and a hydration reaction of hydrating the aromatic nitrile compound with the generated water to generate an aromatic amide compound; and

a second reaction step of, after the aromatic amide compound is separated from a reaction system of the first reaction step, regenerating the aromatic amide compound into an aromatic nitrile compound by a dehydration reaction of dehydrating the aromatic

amide compound in a solvent comprising one or a plurality of substances selected from 1,2,3,4-tetrahydronaphthalene, 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene by use of a catalyst comprising cesium;

wherein at least a part of the aromatic nitrile compound regenerated in the second reaction step is used in the first reaction step,

wherein the dehydration reaction is performed in a state where the solvent is boiled,

wherein the aromatic amide compound at least comprises pyridine carboamide, and the aromatic nitrile compound at least comprises cyanopyridine,

wherein the carbonate ester generation reaction uses a catalyst comprising cerium and wherein a total amount of the one or the plurality of substances selected from 1,2,3,4-tetrahydronaphthalene, 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene is 40% by weight or greater with respect to the solvent.

21. A method for producing a carbonate ester, comprising:

a first reaction step including a carbonate ester generation reaction of reacting an alcohol and carbon dioxide in the presence of an aromatic nitrile compound to generate a carbonate ester and water, and a hydration reaction of hydrating the aromatic nitrile compound with the generated water to generate an aromatic amide compound; and

a second reaction step of, after the aromatic amide compound is separated from a reaction system of the first reaction step, regenerating the aromatic amide compound into an aromatic nitrile compound by a dehydration reaction of dehydrating the aromatic amide compound in a solvent formed of only one or a plurality of substances selected from 1,2,3,4-tetrahydronaphthalene, 1,2-dimethoxybenzene, 1,3-dimethoxybenzene and 1,3,5-trimethoxybenzene by use of a catalyst comprising cesium;

wherein at least a part of the aromatic nitrile compound regenerated in the second reaction step is used in the first reaction step,

wherein the dehydration reaction is performed in a state where the solvent is boiled,

wherein the aromatic amide compound at least comprises pyridine carboamide, and the aromatic nitrile compound at least comprises cyanopyridine and

wherein the carbonate ester generation reaction uses a catalyst comprising cerium.