diethylamine, ethylpropylamine, and ethylisopropylamine in the crude trialkylamine than the concentration before contacting with the zeolite,

wherein the crude trialkylamine has a purity of 99 GC area % or higher.

[0010b]

In another aspect, there is provided a method for purifying a trialkylamine, comprising:

contacting a crude trialkylamine containing at least dimethylamine as an impurity with a zeolite having pores of 0.2 to 0.6 nm in diameter to lower a concentration of the dimethylamine in the crude trialkylamine than the concentration before contacting with the zeolite,

wherein the crude trialkylamine has a purity of 98 % by weight or more; and

the concentration of dimethylamine in the crude trialkylamine is lowered to 300 ppm by volume or less.

[0010c]

In another aspect, there is provided a method for producing a trialkylamine, comprising:

synthesizing a crude trialkylamine; and

purifying the crude trialkylamine by the method as defined above.

[0010d]

In another aspect, there is provided a composition comprising:

a trialkylamine in an amount of 99.9 GC area % or more; and

diethylamine in an amount of 1 GC area ppm or more and 100 GC area ppm or less, and

wherein the purity of the trialkylamine is 99.95 GC area % or higher.

[0010e]

In another aspect, there is provided a composition comprising:

a trialkylamine in an amount of 99.9 GC area % or more; and

ethylpropylamine in an amount of 1 GC area ppm or more and 100 GC area ppm or less, and
wherein the purity of the trialkylamine is 99.95 GC area % or higher.

[0010f]

In another aspect, there is provided a composition comprising:
a trialkylamine in an amount of 99.9 GC area % or more; and
ethylisopropylamine in an amount of 1 GC area ppm or more and 15 GC area ppm or less, and
wherein the purity of the trialkylamine is 99.95 GC area % or higher.

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[0011]

Specifically, a first method for purifying a trialkylamine of the present disclosure includes:
contacting a crude trialkylamine containing at least one impurity selected from the group consisting of diethylamine, ethylpropylamine, and ethylisopropylamine with a zeolite to lower a concentration of the at least one impurity selected from the group consisting of diethylamine, ethylpropylamine, and ethylisopropylamine in

CLAIMS

Claim 1. A method for purifying a trialkylamine, comprising:

contacting a crude trialkylamine containing at least one impurity selected from the group consisting of diethylamine, ethylpropylamine, and ethylisopropylamine with a zeolite to lower a concentration of the at least one impurity selected from the group consisting of diethylamine, ethylpropylamine, and ethylisopropylamine in the crude trialkylamine than the concentration before contacting with the zeolite,

wherein the crude trialkylamine has a purity of 99 GC area % or higher.

Claim 2. The method for purifying a trialkylamine according to claim 1,

wherein the trialkylamine after contacting with the zeolite has a purity of 99.9 GC area % or higher.

Claim 3. The method for purifying a trialkylamine according to claim 1 or 2,

wherein the crude trialkylamine contains at least diethylamine as the impurity, and

the diethylamine is contained in the trialkylamine after contacting with the zeolite in an amount of 150 GC area ppm or less.

Claim 4. The method for purifying a trialkylamine according to any one of claims 1 to 3,

wherein the crude trialkylamine contains at least diethylamine as the impurity, and

the diethylamine is contained in the trialkylamine after contacting with the zeolite in an amount of 100 GC area ppm or less.

Claim 5. The method for purifying a trialkylamine according to claim 3 or 4,

wherein the crude trialkylamine contains diethylamine in an amount of more than 150 GC area ppm.

Claim 6. The method for purifying a trialkylamine according to any one of claims 1 to 5,

wherein the crude trialkylamine contains ethylpropylamine in an amount of more than 150 GC area ppm or contains ethylisopropylamine in an amount of more than 20 GC area ppm.

Claim 7. The method for purifying a trialkylamine according to any one of claims 1 to 6,

wherein the zeolite is dried at 100°C or higher for one hour or longer prior to contact with the crude trialkylamine.

Claim 8. The method for purifying a trialkylamine according to any one of claims 1 to 7,

wherein all three alkyl groups in the trialkylamine are the same groups.

Claim 9. The method for purifying a trialkylamine according to any one of claims 1 to 8,

wherein the trialkylamine is triethylamine.

Claim 10. The method for purifying a trialkylamine according to claim 9,

wherein a crude triethylamine in a liquid state is contacted with the zeolite at 10°C or higher and 40°C or lower.

Claim 11. The method for purifying a trialkylamine

according to any one of claims 1 to 10,

wherein the zeolite has pores of 0.8 to 1.2 nm in diameter.

Claim 12. A method for purifying a trialkylamine, comprising:

contacting a crude trialkylamine containing at least dimethylamine as an impurity with a zeolite having pores of 0.2 to 0.6 nm in diameter to lower a concentration of the dimethylamine in the crude trialkylamine than the concentration before contacting with the zeolite,

wherein the crude trialkylamine has a purity of 98 % by weight or more; and

the concentration of dimethylamine in the crude trialkylamine is lowered to 300 ppm by volume or less.

Claim 13. The method for purifying a trialkylamine according to claim 12,

wherein the zeolite is dried at 1 kPa or less at 150°C or higher for 30 minutes or longer prior to contact with the crude trialkylamine.

Claim 14. The method for purifying a trialkylamine according to any one of claims 12 to 13,

wherein all three alkyl groups in the trialkylamine are the same groups.

Claim 15. The method for purifying a trialkylamine according to any one of claims 12 to 14,

wherein the trialkylamine is trimethylamine.

Claim 16. The method for purifying a trialkylamine according to claim 15,

wherein a crude trimethylamine in a gaseous state is flowed to contact with the zeolite at 20°C to 30°C and at

atmospheric pressure or higher for 100 seconds or longer.

Claim 17. The method for purifying a trialkylamine according to any one of claims 12 to 16,
wherein the crude trialkylamine before contacting with the zeolite has a concentration of the dimethylamine of 500 to 1500 ppm by volume.

Claim 18. The method for purifying a trialkylamine according to any one of claims 12 to 17,
further comprising distilling a trialkylamine obtained by contacting the crude trialkylamine with the zeolite.

Claim 19. A method for producing a trialkylamine, comprising:
synthesizing a crude trialkylamine; and
purifying the crude trialkylamine by the method according to any one of claims 1 to 18.

Claim 20. A composition comprising:
a trialkylamine in an amount of 99.9 GC area % or more; and
diethylamine in an amount of 1 GC area ppm or more and 100 GC area ppm or less, and
wherein the purity of the trialkylamine is 99.95 GC area % or higher.

Claim 21. A composition comprising:
a trialkylamine in an amount of 99.9 GC area % or more; and
ethylpropylamine in an amount of 1 GC area ppm or more and 100 GC area ppm or less, and
wherein the purity of the trialkylamine is 99.95 GC area % or higher.

Claim 22. A composition comprising:

a trialkylamine in an amount of 99.9 GC area % or more; and

ethylisopropylamine in an amount of 1 GC area ppm or more and 15 GC area ppm or less, and

wherein the purity of the trialkylamine is 99.95 GC area % or higher.

Claim 23. The composition according to any one of claims 20 to 22,

wherein all three alkyl groups in the trialkylamine are the same groups.

Claim 24. The composition according to any one of claims 20 to 23,

wherein the trialkylamine is triethylamine.