SUMMARY

- Technical Problem

[0008]

Patent Literature 3 only discloses a method for removing monomethylamine using a synthetic zeolite, and does not disclose the removal of diethylamine, ethylpropylamine, ethylisopropylamine, and dimethylamine using a synthetic zeolite. Therefore, the removal of diethylamine, ethylpropylamine, ethylisopropylamine, and dimethylamine using a synthetic zeolite has not known.

[0009]

In view of the above issue, the present disclosure aims to provide a novel method for lowering the concentrations of dimethylamine, diethylamine, ethylpropylamine, and ethylisopropylamine in a crude trialkylamine.

- Solution to Problem

[0010]

The present inventors made intensive studies to find that the concentrations of dimethylamine, diethylamine, ethylpropylamine, and ethylisopropylamine in an impurity-containing crude trialkylamine can be lowered by contacting the crude trialkylamine with a zeolite. Thus, the present disclosure was completed.

[0010a]

In an aspect of the present disclosure, there is provided 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.

[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.

[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 150 GC area ppm or less.

[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 150 GC area ppm or less.

[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 20 GC area ppm or less.

[0010g]

In another aspect, there is provided a composition comprising:

a trialkylamine in an amount of 99.9% by weight or more; and

dimethylamine in an amount of 50 ppm by volume or more and 400 ppm by volume or less.

[0010h]

In another aspect, there is provided a composition comprising:

a trialkylamine in an amount of 99.9% by weight or more; and

dimethylamine in an amount of 10 ppm by volume or less.

[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

more; and ethylpropylamine in an amount of 1 GC area ppm or more and 150 GC area ppm or less.

A third composition of the present disclosure contains: 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 20 GC area ppm or less.

The units "GC area %" and "GC area ppm" indicate the proportion of the area of the peaks derived from the component to be quantified in the total area of the peaks obtained by gas chromatography (GC).

A fourth composition of the present disclosure contains: a trialkylamine in an amount of 99.9% by weight or more; and dimethylamine in an amount of 50 ppm by volume or more and 400 ppm by volume or less.

A fifth composition of the present disclosure contains: a trialkylamine in an amount of 99.9% by weight or more; and dimethylamine in an amount of 10 ppm by volume or less.

The first to fifth compositions of the present disclosure can be used in the production process of pharmaceutical products and the production process of semiconductors which require high-purity raw materials.

- Advantageous Effects of the Disclosure

[0015]

The method for purifying a trialkylamine of the present disclosure enables the removal of impurities in a crude trialkylamine to increase the concentration of the trialkylamine by a simple operation without the use of additives, thereby supplying an extremely pure trialkylamine that can be used in the production process of pharmaceutical products and the production process of semiconductors.

DESCRIPTION OF EMBODIMENTS