to supply continuously at a constant makeup.

CITATION LIST

- Patent Literature

[0005]

Patent Literature 1: JP 2007-63159 A

Patent Literature 2: JP H03-241832 A

SUMMARY OF DISCLOSURE

- Technical Problem

[0006]

Supply methods utilizing compositional azeotropy reported include a method of supplying hydrogen fluoride and ethanol in the form of mixture (e.g., Patent Literature 2). Still, no method of supplying amines utilizing compositional azeotropy has been known.

[0007]

In response to the above issue, the present disclosure aims to provide a method for stably supplying trimethylamine containing monomethylamine and/or dimethylamine as trace impurities at a constant makeup.

- Solution to Problem

[0008]

As a result of extensive studies, the present inventors found that adding a small amount of dimethylethylamine to trimethylamine can form a stable azeotrope of trimethylamine with trace amounts of other methylamines such as monomethylamine and/or dimethylamine, which enables supply at a stable gas makeup regardless of the amount of trimethylamine used. Thus, the present disclosure was completed.

[0009]

In one aspect, there is provided a method for supplying a composition comprising: keeping a storage

container that encloses a composition therein at a constant temperature of 10°C or higher to supply a gas of the composition to a predetermined device, the composition containing in a gaseous phase, trimethylamine, dimethylethylamine, and at least one of dimethylamine or monomethylamine.

The method for supplying a composition of the present disclosure can supply the composition containing trimethylamine, dimethylethylamine, and at least one of dimethylamine or monomethylamine at a stable gas makeup regardless of the amount of trimethylamine used.

[0010]

The composition of the present disclosure is intended to be used in the aforementioned method for supplying a composition, and contains trimethylamine, dimethylethylamine, and at least one of dimethylamine or monomethylamine in a gaseous phase.

Since the composition of the present disclosure contains dimethylethylamine, trimethylamine can be supplied at a stable gas makeup even when trimethylamine contains dimethylamine and/or monomethylamine as impurities. Further, dimethylethylamine has a structure similar to that of trimethylamine. Thus, advantageously, the presence of dimethylethylamine exerts less influence when the composition is used as an etching gas.

[0010a]

In another aspect, there is provided a composition comprising trimethylamine, dimethylethylamine, and at least one of dimethylamine or monomethylamine in a gaseous phase for use in the method for supplying a composition as described above.

[0011]

In another aspect, there is provided a dry etching method of the present disclosure comprising: reacting a gaseous composition supplied by the method for supplying a composition as described above and gaseous hydrogen fluoride with a silicon oxide without a plasma state.

Since the dry etching method of the present disclosure causes a gas of a composition having a stable makeup containing trimethylamine to react with a silicon oxide by the aforementioned method for supplying a

composition, an etching treatment can be performed stably.

- Advantageous Effects of Disclosure

[0012]

In the method for supplying a composition of the present disclosure, adding a small amount of dimethylethylamine to trimethylamine can minimize a change in each of the amounts of dimethylamine and/or monomethylamine contained as impurities regardless of the amount of trimethylamine used when trimethylamine is supplied at a temperature under a certain condition, and therefore trimethylamine can be supplied at a stable gas makeup.

DESCRIPTION OF EMBODIMENTS

[0013]

Hereinafter, the present disclosure is described in detail. The following descriptions of constituent elements are examples of embodiments of the present disclosure and the present disclosure is not limited to these specific descriptions. Various modifications may be made within the scope of the gist of the present disclosure.

[0014]

The method for supplying a composition of the present disclosure includes: keeping a storage container that encloses a composition therein at a constant temperature of 10°C or higher to supply a gas of the composition to a predetermined device, the composition containing, in a gaseous phase, trimethylamine, dimethylethylamine, and at least one of dimethylamine or monomethylamine.

The composition containing trimethylamine and other components in the storage container is mostly in a liquid phase based on its weight, while partly in a gaseous phase. In the method for supplying a composition of the present disclosure, the gaseous phase in the storage container,