the component (C) is 1% by weight to 80% by weight of at least one acid selected from the group consisting of hydrochloric acid, nitric acid, sulfuric acid, and phosphoric acid,

the component (D) is water, and

the total content of at least one of the component (A) or the component (B) and the component (C) is 90% by weight or less, based on the total amount of the microprocessing treatment agent.

[0013a]

In a first aspect, there is provided a microprocessing treatment agent for use in fine processing of an object having a silicon nitride film and a silicon oxide film, comprising:

a component (A) a component (B) a component (C) and a component (D), wherein

the component (A) is 0.01% by weight to 20% by weight of hydrogen fluoride,

the component (B) is 0.1% by weight to 20% by weight of at least one of ammonium fluoride or quaternary ammonium fluoride,

the component (C) is 1% by weight to 80% by weight of at least one acid selected from the group consisting of hydrochloric acid, nitric acid, sulfuric acid, and phosphoric acid,

the component (D) is water, and

the total content of the component (A), the component (B), and the component (C) is 90% by weight or less, based on the total amount of the microprocessing treatment agent, wherein the microprocessing treatment agent allows selective fine processing of the silicon oxide film to the silicon nitride film.

[0014]

According to the feature, the composition containing a combination of at least one of the component (A) or the component (B) and the component (C) can have high etching selectivity of a silicon oxide film to a silicon nitride film (silicon oxide film/silicon nitride film). Therefore, when the microprocessing treatment agent of the invention is used in fine processing of an object including a silicon oxide film and a silicon nitride film stacked sequentially, selective fine processing of the silicon oxide film to the silicon nitride film can be achieved. This can improve the yield ratio in a semiconductor device manufacturing process.

[0015]

In the composition, the content of the acid as the component (C) is in the range of 1 to 80% by weight. When the lower limit is set at 1% by weight, the addition of the

oxide film using the microprocessing treatment agent described above.

[[0017a]

In a second aspect, there is also provided a microprocessing treatment method, comprising performing selective fine processing of a silicon oxide film to the silicon nitride film using the microprocessing treatment agent as defined above.

[EFFECTS OF THE INVENTION]

[0018]

The invention produces the advantageous effects as described below by the means described above.

Specifically, when a laminated film composed of at least a silicon oxide film and a silicon nitride film is subjected to fine processing, the invention makes possible selective fine processing of only the silicon oxide film, so that successful fine processing can be achieved, for example, in the manufacture of semiconductor devices, liquid crystal display devices, micromachine devices, etc.

[EMBODIMENTS OF THE INVENTION]

[0019]

An embodiment of the invention is described below.

A microprocessing treatment agent according to an embodiment of the invention contains at least one of the component (A) or (B) below and contains the components (C) and (D) below.

Component (A): 0.01% by weight to 20% by weight of hydrogen fluoride

Component (B): 0.1% by weight to 20% by weight of at

CLAIMS

1. A microprocessing treatment agent for use in fine processing of an object having a silicon nitride film and a silicon oxide film, comprising:

~~at least one of~~ a component (A) ~~or~~ a component (B)~~,~~ a component (C)~~,~~ and a component (D), wherein

the component (A) is 0.01% by weight to 20% by weight of hydrogen fluoride,

the component (B) is 0.1% by weight to 20% by weight of at least one of ammonium fluoride or quaternary ammonium fluoride,

the component (C) is 1% by weight to 80% by weight of at least one acid selected from the group consisting of hydrochloric acid, nitric acid, sulfuric acid, and phosphoric acid,

the component (D) is water, and

the total content of ~~at least one of~~ the component (A)~~,~~ ~~or~~ the component (B)~~,~~ and the component (C) is 90% by weight or less, based on the total amount of the microprocessing treatment agent, wherein the microprocessing treatment agent allows selective fine processing of the silicon oxide film to the silicon nitride film.

2. The microprocessing treatment agent according to claim 1, wherein the silicon oxide film is any one of a native oxide film, a thermal silicon oxide film, a non-

doped silicate glass film, a phosphorus-doped silicate glass film, a boron-doped silicate glass film, a boron-and-phosphorus-doped silicate glass film, a TEOS film, or a fluorine-containing silicon oxide film.

3. A microprocessing treatment method, comprising performing selective fine processing of a silicon oxide film to the silicon nitride film using the microprocessing treatment agent according to claim 1 or 2.