

CLAIMS

1. An etching method comprising an etching step in which an etching gas containing fluorine gas is brought into
5 contact with a member to be etched including an etching target being a target of etching with the etching gas and a non-etching target not being the target of the etching with the etching gas in an absence of plasma to selectively etch the etching target with respect to the non-etching target,
10 wherein the etching target contains a silicon compound including at least one of a nitrogen atom or an oxygen atom and a silicon atom;

wherein the non-etching target includes at least one selected from tantalum, cobalt, copper, titanium nitride,
15 nickel, and amorphous carbon; ~~and~~

wherein the etching step is performed under temperature conditions of from 40°C to less than 350°C; and
wherein the etching gas consists of only fluorine gas,
or a mixed gas consisting of fluorine gas and inert gas.

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2. The etching method according to claim 1, wherein the silicon compound is at least one of silicon oxide or silicon nitride.

25 3. The etching method according to claim 1 or 2, wherein the etching step is performed under pressure conditions of from 1 Pa to 100 kPa.

4. The etching method according to any one of claims 1 to 3, wherein the etching step is performed under temperature conditions of from 70°C to 330°C.

5 ~~5. The etching method according to any one of claims 1 to 4, wherein the etching gas is a gas comprising only fluorine gas or is a mixed gas containing fluorine gas and inert gas.~~

10 ~~6~~5. The etching method according to claim ~~5~~1, wherein the inert gas is at least one selected from nitrogen gas, helium, argon, neon, krypton, and xenon.

15 ~~7~~6. The etching method according to any one of claims 1 to ~~6~~5, wherein an amount of the fluorine gas contained in the etching gas is from 0.5% by volume to 70% by volume.

20 ~~8~~7. The etching method according to any one of claims 1 to ~~7~~6, wherein the non-etching target is used as a resist in the etching of the etching target with the etching gas.

25 ~~9~~8. The etching method according to any one of claims 1 to ~~8~~7, wherein an etching selectivity ratio being a ratio of an etching rate of the etching target to an etching rate of the non-etching target is 3 or more.

~~10~~9. A method for manufacturing a semiconductor element, the method using the etching method according to any

one of claims 1 to ~~9~~8 to manufacture the semiconductor element,
wherein the member to be etched is a semiconductor substrate
including the etching target and the non-etching target; and
wherein the method comprises a processing step of removing
5 at least a part of the etching target from the semiconductor
substrate by the etching.