CLAIMS

1. An etching method comprising an etching step in which an etching gas containing fluorine gas is brought into 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,

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, nickel, and amorphous carbon;

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.

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

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

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

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

8. The etching method according to any one of claims 1 to 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.

9. A method for manufacturing a semiconductor element, the method using the etching method according to any one of claims 1 to 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

at least a part of the etching target from the semiconductor substrate by the etching.