**Abstract**

A processing gas constituted of $C_5F_8$, $O_2$ and Ar achieving a flow rate ratio of $1 \leq C_5F_8$ flow rate/$O_2$ flow rate $\leq 1.625$ is supplied into a processing chamber 102 of an etching apparatus 100 and the atmosphere pressure is set within a range of 45mTorr ~ 50mTorr. High-frequency power is applied to a lower electrode 110 sustained within a temperature range of 20°C ~ 40°C on which a wafer W is mounted to raise the processing gas to plasma, and using the plasma, a contact hole 210 is formed at an $SiO_2$ film 208 on an SiNx film 206 formed at the wafer W. The use of $C_5F_8$ and $O_2$ makes it possible to form a contact hole 210 achieving near-perfect verticality at the $SiO_2$ film 208 and also improves the selection ratio of the SiO2 film 208 relative to the SiNx film 206. $C_5F_8$, which becomes decomposed over a short period of time when released into the atmosphere, does not induce the greenhouse effect.