

METHOD FOR PRODUCING INSULATOR FILM

ABSTRACT

In a case where a CF film is used as an interlayer insulator film for a semiconductor device, when a wiring of W (tungsten) is formed, the CF film is heated to a temperature of, e.g., about 400
5 to 450°C. At this time, F gases are desorbed from the CF film, so that there are various disadvantages due to the corrosion of the wiring and the decrease of film thickness.

A CF gas and a hydrocarbon gas are used as thin film deposition gases. These gases are activated as plasma to deposit
10 a CF film on a semiconductor wafer using active species thereof. Subsequently, before forming a wiring, annealing is carried out at a temperature of, e.g., 425°C, for 10 minutes to 2 hours using N₂, H₂ or F₂ gas as a process gas at a flow rate of 50 sccm~10 slm under a pressure of from 0.1 Pa to 1 MPa (from 0.1 Pa to 100 KPa
15 in the case of H₂ gas), to desorb F, CF, CF₂ and CF₃ from the CF film. Thermo stability is improved by the recombination of uncombined materials produced by the desorption.

(Fig. 6)