

PLASMA THIN-FILM DEPOSITION METHOD

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
5 400 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.

As thin-film deposition gases, cyclic C_3F_8 gas and a hydrocarbon gas, e.g., C_2H_4 gas, are used. These gases are
10 activated as plasma under a pressure of, e.g., 0.1 Torr, to deposit a CF film on a semiconductor wafer at a process temperature of 400°C using active species thereof.

Alternatively, cyclic C_6F_6 gas is used as a thin-film deposition gas, and activated as plasma under a pressure of, e.g.,
15 0.06 Pa, to deposit a CF film on a semiconductor wafer at a process temperature of 400°C using active species thereof.

(Fig. 2)