

IMPROVED GAP-FILL DEPOSITIONS IN THE FORMATION OF SILICON CONTAINING DIELECTRIC MATERIALS

ABSTRACT OF THE DISCLOSURE

A chemical vapor deposition method for forming a dielectric material in a trench formed on a substrate, where the method includes the steps of generating water vapor by contacting hydrogen gas and oxygen gas with a water vapor generation catalyst, and providing the water vapor to the process chamber. The method also includes flowing a silicon-containing precursor into the process chamber housing the substrate, flowing an oxidizing gas into the chamber, and causing a reaction between the silicon-containing precursor, the oxidizing gas and the water vapor to form the dielectric material in the trench. The method may also include increasing over time a ratio of the silicon-containing precursor to the oxidizing gas flowed into the chamber to alter a rate of deposition of the dielectric material.

Figure 3A