

REDUCED FLUORINE CONTAMINATION FOR TUNGSTEN CVD

ABSTRACT OF THE DISCLOSURE

A chemical vapor deposition process for depositing a tungsten film on a substrate disposed in a substrate processing. The method includes depositing nucleation and bulk deposition tungsten layers. The nucleation layer is deposited by flowing a first process gas comprising tungsten hexafluoride, silane, molecular hydrogen and argon into said substrate processing chamber, where the flow ratio of molecular hydrogen to argon is at least 1.5:1 and the partial pressure of tungsten hexafluoride is less than or equal to 0.5 Torr. The bulk deposition layer is then deposited over the nucleation layer by flowing a second process gas comprising tungsten hexafluoride and a reduction agent into the substrate processing chamber.

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