A METHOD FOR FORMING A CARBON DOPED OXIDE LOW-K INSULATING LAYER

ABSTRACT

A method for forming a dielectric insulating layer with a reduced dielectric constant and increased hardness for semiconductor device manufacturing including providing a semiconductor wafer having a process surface for forming a dielectric insulting layer thereover; depositing according to a CVD process a carbon doped oxide layer the CVD process including an organo-silane precursor having Si-O groups and $Si-R_y$ groups, where R is an alkyl or cyclo-alkyl group and y the number of R groups bonded to Si; and, exposing the carbon doped oxide layer to a hydrogen plasma treatment for a period of time thereby reducing the carbon doped oxide layer thickness including reducing the carbon doped oxide layer dielectric constant and increasing the carbon doped oxide layer hardness.

Figure 3.

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