

CONFORMAL DOPING VIA PLASMA ACTIVATED ATOMIC LAYER DEPOSITION AND CONFORMAL FILM DEPOSITION

ABSTRACT

Disclosed herein are methods of doping a patterned substrate in a reaction chamber. The methods may include forming a first conformal film layer which has a dopant source including a dopant, and driving some of the dopant into the substrate to form a conformal doping profile. In some embodiments, forming the first film layer may include introducing a dopant precursor into the reaction chamber, adsorbing the dopant precursor under conditions whereby it forms an adsorption-limited layer, and reacting the adsorbed dopant precursor to form the dopant source. Also disclosed herein are apparatuses for doping a substrate which may include a reaction chamber, a gas inlet, and a controller having machine readable code including instructions for operating the gas inlet to introduce dopant precursor into the reaction chamber so that it is adsorbed, and instructions for reacting the adsorbed dopant precursor to form a film layer containing a dopant source.

FIG. 6

