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Position-controlled formation of Si nanopores by chemical vapor deposition of SiC/SOI(100)

Abstract

We investigated the position-controlled nanopore formation in the surface of thin Si layer of a Silicon on Insulator (SOI) substrate by utilizing chemical vapor deposition (CVD). The Si membrane was obtained by anisotropic etching of the handle wafer. The SiC film growth was carried out from the backside surface by utilizing CH3SiH3 pulse jet CVD at the substrate temperature of 900 degrees C. Square pits with the sizes of <= 0.5 mu m were observed on the Si membrane while no pit was formed on the top Si layer. This result indicates that the position of the nanopores on the top Si layer can be controlled without using SiO2 masks on the front side surface.