

MORPHOLOGY AND OPTICAL PROPERTIES
OF TETRAGONAL Ge NANOCCLUSERS GROWN
ON CHEMICALLY OXIDIZED Si(100) SURFACES

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S u m m a r y

Germanium (Ge) nanoclusters are grown by the molecular-beam epitaxy technique on a chemically oxidized Si(100) surface at 700 °C. X-ray diffraction and photocurrent spectroscopy demonstrate that the nanoclusters have the local structure of body-centered-tetragonal Ge, which exhibits an optical adsorption edge at 0.48 eV at 50 K. Deposition of silicon on the surface with Ge nanoclusters leads to the surface reconstruction and the formation of a polycrystalline diamond-like Si coverage, while the nanoclusters core becomes tetragonal SiGe alloy. The intrinsic absorption edge is shifted to 0.73 eV due to Si-Ge intermixing. Possible mechanisms for nanoclusters growth are discussed.