

Low-energy positrons at the Si(100)-2×1 surface with adsorbed hydrogen and oxygen

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Abstract

Positron annihilation induced Auger spectra from the Si(100) surface exposed to hydrogen and oxygen are analyzed by performing calculations of positron surface states and annihilation characteristics of surface trapped positrons. Positron binding energies and work functions are also computed. It is found that the adsorption of hydrogen and oxygen on the Si(100) surface displaces the positron surface state wave function away from the substrate Si atoms, reducing the annihilation probability of surface-trapped positrons with Si core electrons, in agreement with experimental data.

Keywords

Annihilation, Auger, Hydrogen, Oxygen, Positron, Silicon, Surface