

## Peculiar charge transfer of doping atoms on the surface: Sb-induced Si(114)-2×2

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The Sb/Si(114)-2×1 surface, deposited at room temperature (RT) and post-annealed up to 600 °C, has been studied by scanning tunneling microscopy and synchrotron core-level photoemission spectroscopy. With 1.25 ML of Sb-deposition at RT and subsequent postannealing at 600 °C, the surface structure has been transformed from 2×1 to 2×2 and all the Si 2*p* components related to the clean surface have disappeared, while the Sb-Si interfacial component has been identified (as shown in the figure). Such a component is mainly due to charge transfer between Si and Sb atoms at the top layer. At the same time, Sb 4*d* core-level spectrum shows one component, which implies that Sb atoms adsorbed on a unique environment. Based on these results, a structural model will be shown and the reconstructing mechanism induced by Sb adsorption will be discussed.

