

Synchrotron radiation photoemission study of the electronic structure of the ultrathin K/AlN interface

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The electronic structure of the clean AlN surface and the ultrathin K/AlN interface has been studied *in situ* by synchrotron-based photoelectron spectroscopy using the photon energies in the range of 100–650 eV. The effect of K adsorption was studied. Changes in the valence band and in the Al 2*p*, N 1*s*, and K 3*p* core levels spectra have been investigated using K submonolayer deposition. Modification of the surface electronic structure of the AlN caused by K adsorption is found to originate from the local interaction of N surface atoms and K adatoms. As a results the suppression of intrinsic surface state and appearance of a new induced state are observed. It was found the K-induced electron redistribution effect that causes the positive energy shift of N 1*s* surface peak and increasing N-ionicity.

Keywords: III-nitrides, electronic structure, surface states, metal-III-nitride interfaces, photoelectron spectroscopy.

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