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Aromatic-Like Carbon Nanostructures Created on the Vicinal SiC Surfaces

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Electronic structure of the ultrathin Cs, Ba/SiC(111)-4°, 8° interfaces have been studied in situ in an ultrahigh vacuum using synchrotron-based photoelectron spectroscopy. Change in the C 1*s* and Si 2*p* core level spectra was studied upon the adsorption of Cs or Ba within the submonolayer coverage range. The formation of a new, previously unknown carbon nanostructure was revealed under adsorption of Cs or Ba atoms. Data show that the nanostructure is formed exclusively on SiC vicinal surfaces in the presence of stabilizing adsorbed metal atoms, such as Cs or Ba atoms. It is established that the carbon nanostructure consists of carbon rings, in which chemical bonds are similar in nature to the bonds inherent in aromatic compounds.

Keywords: Silicon carbide, vicinal surface, interface, electronic structure, photoelectron spectroscopy.