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# Surface chemical composition of SiC-cored nanowires investigated at room and elevated temperatures in ultra-high vacuum

Adam Busiakiewicz [a,*], Andrzej Huczko [b], Michal Soszynski [b], Krzysztof Polanski [a], Rogala Maciej [a], Zbigniew Klusek [a]

[a] Department of Solid State Physics, University of Lodz, 90-236 Lodz, Pomorska 149/153, Poland
[b] Department of Chemistry, Warsaw University, Pasteura 1, 02-093 Warsaw, Poland

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ABSTRACT

Nanowires with SiC core were produced via Si/PTFE combustion synthesis in air and deposited from 1,2-dichloroethane suspension on an Au (111) surface. The dependence of the chemical bonding states on temperature (300–673 K) between different elements being a building material of nanowires' sidewalls was investigated by X-ray photoelectron spectroscopy (XPS) in ultra-high vacuum (UHV) conditions. Apart from silicon and carbon, the presence of oxygen and nitrogen was observed. Moreover, $Si_3N_4$ seems to be the second most important compound (after SiC) forming the amorphous outer shell of SiC nanowires. It is shown that carbon-containing compounds (oxides, nitrides, hydrocarbons) are substantially removed under annealing. It is also reported that a noticeable part of subsurface oxygen in the outer shell reacts with nitrogen at 473–573 K forming stable N–O bonds on nanowires' surface.