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Characterization of the different energy-gap multilayer structures using near field microscopy

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Keywords

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Abstract

One of the materials which can be used in high-temperature electronic devices is silicon carbide (SiC). Its properties are very promising, however, a number of technological issues must be solved first, and complex phenomena connected with contact development must be investigated. In this paper, some results the measurements of electrical parameters of the silicon carbide based multilayer SiC:Zr-NiCrSi-Ag systems developed on glass substrate by magnetron co-sputtering method from compositional target are presented. This system was tested electrically as potentially useful to SiC and TiO₂ layers contact. Due to the presence of potential barriers, observed with conventional methods, one should use a more precise and sophisticated instrument. One of the important tools which can be used in order to obtain the information about morphological and electrical properties of the surface is the near-field microscopy. Two modes were used during the measurements: EFM (electrostatic force microscopy) and SP (surface potential imaging). Those techniques allow obtaining several sets of data describing different properties of the sample. Moreover, its sophisticated nature delivers the information in submicron scale and no influence on the structure and phenomena is introduced. Also the multichannel data acquisition allows a certain amount of data concerning signals to be collected, which is very useful for the analysis of results in order to identify the presence of artifacts. Some results obtained during preliminary work are hereby presented and described.



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