

FIELD EMISSIVE PROPERTIES OF CARBON NANOTUBE THREADS

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ABSTRACT

For the past twenty years special attention is drawn towards field emissive properties of carbon materials, which are considered to be the most promising in field emission electronics development [1, 2]. Unique structure and characteristics of carbon nanotubes make them irreplaceable in production of such electronic devices as quantum wires, diodes, field emission transistors, sensors and cold cathodes of field emitters.

High aspect ratio L/R and the fact that near a nanotube the electric field is hundreds of times more than volume averaged ratio of voltage drop over the interelectrode gap define outstanding emissive properties of carbon nanotubes. As a result emissive properties are observed at significantly lower voltages, compared to the conventional cold cathodes.

The object of the study is a sample of carbon thread with the diameter of 30-40 mkm, which consists of long bunches of carbon nanotubes.

Structural properties of the sample before and after the several hour exposure in the vacuum chamber were studied in scanning electron microscope. The degree and characteristic of material degradation were assessed. Current–voltage curves of the emissive samples were obtained in different conditions.

References

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