Comparative analysis of field emission properties of SiC powder with different synthesis parameters

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At the present time getting good field emission properties of materials can be achieved by forming on the surface of a dielectric or semiconductor particles of a thin graphite layer. Nanolayer graphitic carbon covers the dielectric particles, which are seemed to support the layer, which took part in active field emission processes. It should be mentioned that such a particle should not be viewed simply as a "mixture" components, as well as a single physical-chemical system, which provides phase mutual influence, which leads to the achievement of positive results.

In this work were examined the samples of SiC powders, which were made by synthesis on the surface of dielectric and semiconductor particles of a thin graphic layer. Such synthesis can be achieved with heat treatment of dielectric or semiconductor powders in medium of gaseous hydrocarbons at a temperature above their thermal decomposition. Under these conditions on the surface of the particle takes place a heterogeneous chemical reaction, this leads to decomposition of hydrocarbon molecules into atoms of carbon and hydrogen molecules. The nascent carbon atoms form a graphite layer, whose thickness increases with increasing heat treatment time. Thereby you obtain particles with the desired thickness of the graphite-like nanolayer [1].

Data were collected in the following order: measured some initial current voltage characteristic, further took down field emission current depending on the time, after the end of the experiment measured another current voltage characteristic, which subsequently compared with the current voltage characteristic, gotten before the experiment began. Were also obtained photographs of field-emission images, where we can see the change of light intensity [2, 3].

After the data were processed, it will be able to make a conclusion in which it is found that the powder with a thin carbon fiber has better field emission properties.

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