

FIELD EMISSION PROPERTIES OF PYROGRAPHITE CATHODES

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ABSTRACT

Emission lamps attract attention lately due to its' eco-friendliness, durability and great emissive characteristics. The structure and emission parameters of carbon materials make them demanded for emission lamp cathodes production. Pyrographite is a great candidate in particular. Pyrographite is a polycrystalline material with high degree on anisotropy. Thus surface field emission of pyrographite highly depends on a location of emissive centers [1]. Nonetheless the high durability results in low emission current fluctuations and high operating stability of the emission lamp, based on a field emission pyrographite cathode. Pyrographite cathodes are relatively cheap and simple to produce and process.

The objects of research are samples of pyrographite cathodes, produced and processed by various methods. That is to determine the effect of surface roughness and emission area on operating mode, durability and efficiency.

To estimate the roughness degree, the scanning electron microscope JEOL JSM 7001F was used. Before and after exposition in vacuum chamber photographs of the cathode samples were made to observe degradation of the material and how operating mode affects the samples. Current-voltage curves were obtained for each sample as well.

[1] Fialkov A.S, The formation of structure and characteristics of carbongraphite materials, M. Metallurgy, 1965