

Photoluminescence and its damping kinetics of nanoporous alumina membranes formed in solutions of various carboxylic acids

I. A. Vrublevsky ¹,

K. V. Chernyakova (Foreign) ²,

E. N. Muratova (Foreign) ³,

Yu. M. Spivak (Foreign) ⁴,

V. A. Moshnikov (Foreign) ⁵

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Abstract: The article is devoted to the study of the photoluminescence of carbon-containing anodic alumina obtained in various electrolytes based on carboxylic (tartaric and oxalic) acids. We studied the emission and excitation spectra of luminescence, as well as the PL decay of nanostructured anodic alumina membranes. It is shown that such membranes exhibit photoluminescence (excitation wavelength 330 nm)

in the wavelength range 350-600 nm with a maximum at 460 nm. They have two PL centers with maxima at 440 and 490 nm and lifetimes of 0.2 and 4.0 ns, respectively. It is shown that the PL peak at 440 nm can be related to the emission of COO⁻ ions, and the peak at 490 nm can be related to the PL of defects in partially oxidized amorphous carbon.

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