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## Synthesis and Luminescent Properties of Gadolinium Tantalum Niobates $Gd(Nb_x Ta_{1-x})O_4$ \*

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The feasibility of synthesizing gadolinium tantalum niobates by the liquid-phase method was demonstrated. The methods of X-ray diffraction, electron probe microanalysis, local cathodoluminescence, and photoluminescence were applied to study the samples. It was shown that under the selected synthesis conditions ( $T \sim 1400^\circ\text{C}$  for 3 hours), no solid solution of niobium-tantalum was formed in the powder samples. When obtaining ceramic samples, it was possible to obtain a solid solution and to study the dependence of the luminescence intensity on the niobium content upon excitation of the samples by an electron beam. The maximum luminescence intensity was observed in the sample with the composition of  $GdNb_{0.9}Ta_{0.1}O_4$ . It was shown that the inhomogeneity of luminescence is not related to fluctuations in composition, but is related to the inhomogeneous distribution of vacancy centers, which are luminescence centers.

**Keywords:** gadolinium tantalum niobates, cathodoluminescence, X-ray diffraction, electron probe microanalysis, liquid-phase synthesis.

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