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Ceramic materials surface structuration with carbon nanotubes: ZnS and MgF₂ optical ceramics

Natalia Kamanina¹ and Kadetskaya Liniya²¹Vavilov State Optical Institute, Russia²"LETI" University, Russia

One of the important optical ceramics are materials based on the magnesium fluoride (MgF₂ - KO₁ optical ceramic) and zinc sulphide (ZnS-KO₂ optical ceramic). In the current paper the change of the main characteristics of these types of the materials is shown. The transmittance spectral change and increase of the micro hardness as well as the increase of the wetting angle are discussed due to the covalent bonding of the carbon nanotubes with the near-surface layers of the matrix model materials. Quantum chemical simulation has supported the data presented. One of the figures connected with the penetration of the CNTs nano-objects in the ZnS substrate is shown in Fig.1. The results established for the MgF₂ and ZnS materials relate to the other ones observed for the different inorganic structures, such as BaF₂, CaF₂, KBr, etc. These data are related to the direct tendency, such as: dramatic change and the correlation between spectral, mechanical and wetting parameters of the optical ceramics can be provoked via nanostructuring of the materials surfaces. The area of the application of the materials studied can be extended effectively.

nvkamanina@mail.ru