



Abstract

A Russian RTD Institute from Saint Petersburg develops a technology for manufacturing transparent fluoride-based nanoceramics with minor optical losses. Optical fluoride nanoceramics is intended for manufacturing elements of fast and powerful lasers and other photon devices. The institute seeks partners for technical cooperation.

Optical fluoride nanoceramics is designed for manufacturing elements of fast operating and powerful lasers and other photon devices.

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Description

To manufacture optical nanoceramics, a specially prepared fluoride-based fusion mixture is used, characterised with small (submicron and less) sizes, special particle form and absence of particle agglomeration. Particularly important is blocking of nanoparticle surface and preventing of adsorption of oxygen-containing admixtures. The researchers intend to use conventional techniques of hot pressing, where ceramic materials are obtained under pressure and temperature conditions.

Unlike other methods of obtaining optical ceramics (infrared range) out of pure calcium fluoride and barium, the proposed technology suggests obtaining optically clear ceramics out of solid solutions of alkaline-earth and rare-earth element fluorides, the rare-earth elements acting as activating agents. In this case, one can expect reduction (and finally, avoidance) of main drawbacks of fluoride ceramics: inclusions of oxide phases and color centers.

Innovations and advantages of the offer

For the first time, optical fluoride nanoceramics is offered that have enhanced mechanical resistance, as compared to monocrystals, a high optical uniformity, a high radiation resistance. This enables manufacturing fast-operating and powerful lasers and other photon devices.

Current and Potential Domain of Application