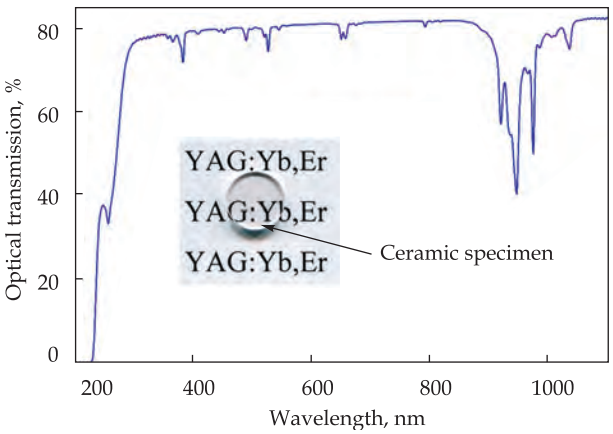
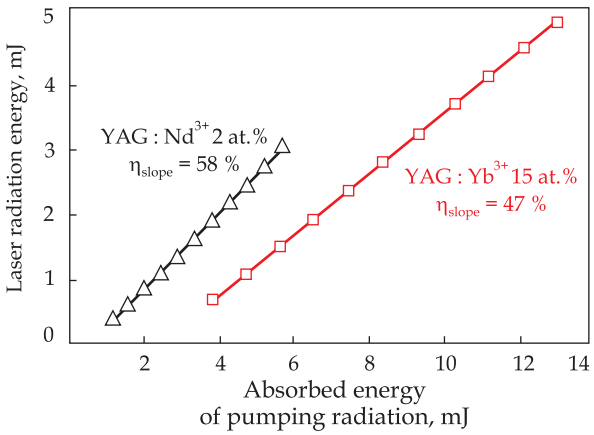
YAG:RE STRUCTURED TRANSPARENT CERAMICS AS ACTIVE MEDIUM FOR SOLID-STATE LASERS IN THE NEAR-IR RANGE



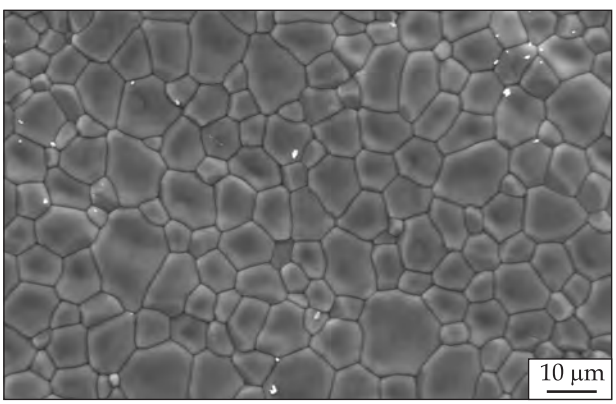


Areas of Application

The ceramic materials based on YAG doped or co-doped by Nd^{3+}, Yb^{3+}, Er^{3+} ions can be used as active media for new types of compact diode-pumped solid-state lasers. The ceramic-based microchip lasers can be employed in the devices for high-accuracy distance measurement, laser location and navigation, in communication and data record systems, and so on

Specification

The garnet phase comprises 100% of ceramic mass. The average size of crystal grains is 10—20 μm. The optical loss for the scattering within the 800—1600 nm spectral range is $\alpha < 0.1$ cm^{-1}. The active ion absorption on the pumping wavelengths (808 nm for Nd and 940 nm for Yb) is >10 cm^{-1}



SEM image of Nd^{3+}:YAG ceramic polycrystalline structure

Advantages

A high homogeneity of dopant distribution in the volume; the cost of active ceramic laser medium is much less than that of the single-crystal one. A high active ion concentration provides a high power density in the active medium with ~2 mm length

Stage of Development. Suggestions for Commercialization

IRL3, TRL4
Laser elements for various applications manufactured upon request

IPR Protection

IPR1, IPR2

Contact Information

Roman P. Yavetskiy, Institute for Single Crystals of the NAS of Ukraine;
+38 057 341 02 77, e-mail: yavetskiy@isc.kharkov.ua