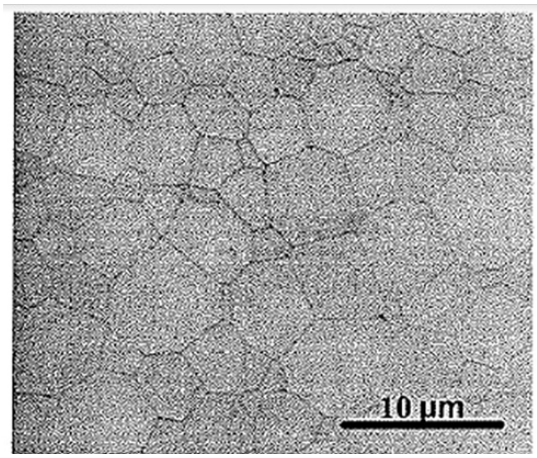
Method for the Fabrication of Transparent YAG Materials

ID# 2006-3198



Microstructure of YAG sample

Technology Summary

The patented invention covers a method of manufacture of transparent yttrium aluminum garnet. This invention relates to a method for making green parts made of YAG using tape casting. These green parts are further processed to produce fully dense, transparent YAG parts. These materials may be pure YAG or YAG doped with rare earth ions to enhance their optical properties.

Application & Market Utility

Transparent ceramics have commercial applications in the field of optical materials. These applications include use as host crystals in solid state lasers, and IR windows and domes. Important properties for materials in these applications include high thermal conductivity, strong crystal fields, and optical transmission over a broad spectral range. Yttrium aluminum garnet (YAG) is an excellent candidate material for these applications. Advantages include shorter processing time over single crystal fabrication, significantly lower expense, greater flexibility in defining size and shape, high thermal conductivity, strong crystal fields, and optical transmission over a broad spectral range.

Next Steps

Sample transfer and evaluation of issued US Patent No. 7,799,267

TECHNOLOGY READINESS LEVEL 4-7

Seeking

Investment | Licensing | Research

Keywords

- transparent ceramics
- solid-state lasers
- transparent armor
- IR windows and domes
- optical materials

Researchers

Gary L. Messing
Distinguished Professor Emeritus of Ceramic Science and Engineering
Online Bio
Website

Elizabeth Kupp
Director, Advanced Materials Processing Lab
Website

Sang-Ho Lee

Other Researchers
Garnia Juwondo

Originating College
College of Earth and Mineral Sciences

Office of Technology Management Contact
Smith, Matthew
mds126@psu.edu
814-863-1122