Non-Confidential Description - PSU No. 3198
“Method for the Fabrication of Transparent YAG Materials”

Keywords:
Transparent ceramics, optical material, crystals, solid state lasers

Links:
Inventor website

Inventors:
Gary L. Messing, Elizabeth Kupp, Sang-Ho Lee, Garnia Juwondo

Background
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.

Invention Description
The present invention relates to transparent yttrium aluminum garnet (YAG) materials. In particular, 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.

Advantages/Applications
• 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

Fig 1: ESEM micrograph (ESEM) showing the microstructure of a tape cast YAG sample

Contact: Matthew D. Smith
Sr. Technology Licensing Officer
The Pennsylvania State University
Phone: (814) 863-1122
Fax: (814) 865-3591
E-mail: mds126@psu.edu

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