The CUNY Center for Advanced Technology In Photonics Applications (CUNY CAT)
Designated by NYSTAR, the New York State Foundation for Science, Technology and Innovation

Growth of Tunable Laser Crystals Based on Cr^{4+} and Other Lasing Ions

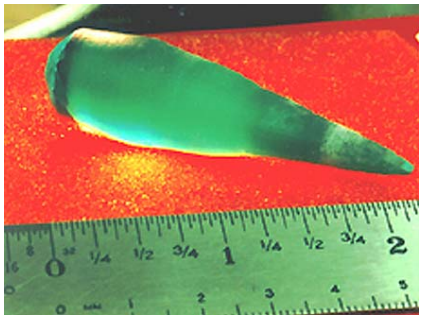
Tunable solid-state lasers allow the user to customize the source to the application. An integral part of this light source is the laser medium. Laser crystals, based on tetravalent chromium (Cr^{4+}) ion operate in the technologically important near infrared (1-2 μm) spectral region.

Applications:

The 1-2 μm spectral range, includes wavelengths at 1.3 and 1.5 μm, both important for optical communications, and the eye-safe wavelength range beyond 1.45 μm. Possible uses include optical communications, eye-safe ranging and remote sensing, and biomedical and scientific applications.

Benefits:

- Eye-safe operation
- All solid-state diode pumped configurations
- Compact and reliable
- Potential for femtosecond operation



Cunyite crystal grown at City College

The technology:

A series of Cr^{4+}-doped crystals is being developed for the 1.2-1.7 μm region. These materials have desirable characteristics - high emission cross sections, wide tuning range, and an absence of parasitic centers. Prime candidates are silicates and germanates such as Cr^{4+}:$CaMgSiO_4$ and Cr^{4+}:Ca_2GeO_4 (Cunyite).

Large laser-quality crystals of highly-doped Cr^{4+}:Ca_2GeO_4 have been grown by a top-seeded solution growth method, which is a combination of vertical pull (Czochralski) and solution (flux) growth techniques. These crystals were used in the first successful tunable laser operation of the Cr^{4+}:Ca_2GeO_4 laser crystal.

This technology opportunity sheet describes continuing efforts in this area. Several patents may have been issued or are pending and which may be available for licensing.

For Details, contact Alan Doctor; email: alan.doctor@qc.cuny.edu; Phone: 718-997-4279 Fax: 718-997-4278
Queens College • Razran 314 • 65-30 Kissena Boulevard • Flushing, NY 11367 www.cunyphotonics.com