Cr^{4+}:YAG - Chromium Doped Yttrium Aluminum Garnet

Introduction

Chromium Doped Yttrium Aluminum Garnet (Cr^{4+}:YAG) is an excellent crystal for passively Q-switching diode pumped or lamp-pumped Nd:YAG, Nd:YLF, Nd:YVO_4 or other Nd and Yb doped lasers at wavelength from 0.8 to 1.2 µm. Because of its chemically stable, durable, UV resistant, good thermal conductivity and high damage threshold (＞500 MW/cm^2) and being easy to be operated, it will replace traditional material, such as LiF, organic Dye and color centers.

CASTECH provides Cr^{4+}:YAG with Cr^{4+} doping level from 0.5 mol% to 3 mol%. The size could be from 2 × 2 mm^2 to 14 × 14 mm^2 with length from 0.1 mm to 12 mm available. We can control the initial transmission from 10% to 92% according to customers' requirements.

Table 1. Basic Properties

Crystal Structure	Cubic
Dopant Level	0.5 mol~3 mol%
Mohs Hardness	8.5 Mohs
Refractive Index, at 1064 nm	1.82
Damage Threshold	500 MW/cm^2 @1064 nm, 10 ns, 10 Hz (AR-coated)

The preliminary experiments of CASTECH's Cr^{4+}:YAG showed that the pulse width of passively Q-switched lasers could be as short as 5 ns for diode pumped Nd:YAG lasers and repetition as high as 10 kHz for diode pumped Nd:YVO_4 lasers. Furthermore, an efficient green output @532 nm, and UV output @355 nm and 266 nm were generated, after a subsequent intracavity SHG in KTP or LBO, THG and FOHG in LBO and BBO for diode pumped and passively Q-switched Nd:YAG and Nd:YVO_4 laser.

Cr^{4+}:YAG is also a laser crystal with tunable output from 1.35 µm to 1.55 µm. It can generate ultrashort pulse laser (to fs pulsed) when pumped by Nd:YAG laser at 1.064 µm.

Note

When ordering Cr^{4+}:YAG crystal, please specify the size, initial transmission and coatings. For further information, please contact CASTECH.