

Quantum Efficiency of Ce^{3+} in YAG and YGG

U. Happek and J. Fleniken
Department of Physics and Astronomy
The University of Georgia
Athens, GA 30602-2451

A.M. Srivastava and H.A. Comanzo
GE Corporate Research and Development
Niskayuna, NY 12309

W.W. Beers
GE Lighting
Cleveland, OH 44110

D. Doxsee
GELcore
Valley View, OH 44125

The luminescence of Ce^{3+} in YGG has been found to be completely quenched at room temperature. At low temperatures, characteristic Ce^{3+} is observed, although the quantum efficiency is still very low. This is in marked contrast to Ce^{3+} doped YAG, which is a relative efficient phosphor material.

The temperature dependence of the quantum efficiency observed in the YGG: Ce^{3+} system is indicative of the Ce^{3+} levels being located energetically close to the host conduction band.

We will present results of photoconductivity and thermal luminescence studies that were performed to find experimental evidence for the origin of the quenching mechanism in YGG, and how this system, in terms of the position of the Ce^{3+} energy levels relative to the host bands, compares to YAG: Ce^{3+} .