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Optical Materials

Optically Active Materials

Oral

Optical spectroscopy of erbium- and thulium-doped  $\text{SnO}_2:\text{SiO}_2$  glass-ceramics

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The advantages of multifunctional integrated optical components in planar devices are well known. For these devices to be small, a planar amplifier with high rare-earth solubility and photosensitivity would be highly desirable. Tin-doped silica has been found to have high negative photosensitivity, with excellent thermal stability. Optical spectroscopy has been carried out on a range of erbium- and thulium-doped tin-silicates, with rare earth doping levels from 200-10,000ppm and tin concentrations from 2-15%. These glass-ceramics were produced by a low-temperature sol-gel method. This paper presents the results of the absorption and emission spectra, with calculations of hydroxyl concentration. The relevant emission lifetime data shows dependency on both tin concentration and rare earth concentration. The implications of these results are then discussed and related to potential device performance.