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光电系统与工程

Er/Yb:KY(WO4)2晶体的各向吸收光谱和上转换发光特性

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摘要:

测试了Er/Yb:KY(WO4)2晶体在室温下3个轴Ng，Np，Nm方向上的吸收光谱，分析比较光谱特性，并计算出各能级跃迁的吸收截面，其中沿Np轴方向有最强的吸收和较大的吸收截面，这有利于激光上能级的粒子数堆积，增大跃迁几率，加强荧光输出。由于掺入Yb3+离子，晶体在980nm附近有很强的吸收和较大的半峰宽。该晶体在980nm激光泵浦下有上转换绿光和红光，3个晶轴Np，Ng，Nm轴方向的上转换荧光，波峰位置相差甚微，强弱区别明显，且呈现的各向异性，其中Np方向最强。

关键词： Er/Yb:KY(WO4)2晶体 各向吸收光谱 上转换发光

Anisotropy absorption and up-conversion spectroscopy of Er/Yb:KY(WO4)2 crystal

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Abstract:

The anisotropy absorption spectroscopy of crystal for 3-axis Nm, Ng, Np were conducted at room temperature. The characteristics of spectroscopy were analyzed and compared. The energy level transition of the absorption cross-sections was calculated. The strongest absorption and biggest absorption cross section parallel to the Np principal axis, which increases the number of accumulation for particles, the transition probability and the fluorescence output. The Yb3+-doped leads to a strong absorption and large half width near 980nm. Under 980nm LD excitation, the up-conversion green and red luminescence was achieved. There is little difference in peak for the up-conversion luminescence of 3-axis Nm, Ng, Np, in which Np is the strongest in the three axes.

Keywords: Er/Yb:KY(WO4)2 crystal;anisotropy absorption spectroscopy up-conversion luminescence

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