



## 论文摘要

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### 多面体 $Y_{1-x}Dy_xVO_4$ 纳米晶的合成及其荧光性能

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**摘要:** 以乙二醇和水为溶剂, 在170 °C用水热法合成多面体 $Y_{1-x}Dy_xVO_4$  ( $0 \leq x \leq 0.1$ ) 纳米晶。用X射线衍射(XRD)、透射电镜(TEM)和光致发光(PL)等手段对产品的结构和性能进行分析和表征。研究表明: 多面体 $Y_{1-x}Dy_xVO_4$  纳米晶均为单晶结构, 其颗粒粒径为20~200 nm; PL光谱显示, 随着退火温度的提高, 多面体 $Y_{1-x}Dy_xVO_4$  纳米晶具有比不规则 $Y_{1-x}Dy_xVO_4$  纳米颗粒更好的荧光性和较好的晶化度, 但产品的 $Y/B$ (黄光强度与蓝光强度的比值)和色纯度下降。

**关键词:** 水热合成;  $Y_{1-x}Dy_xVO_4$  多面体; 光致发光

### Synthesis and fluorescence of polyhedron $Y_{1-x}Dy_xVO_4$ nanocrystals

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**Abstract:**  $Y_{1-x}Dy_xVO_4$  ( $0 \leq x \leq 0.1$ ) nanocrystals with the morphology of polyhedron were synthesized via a hydrothermal route in glycol-water mixtures at 170 °C. The structures and optical properties of the as-prepared samples were investigated using X-ray diffraction, transmission electron microscopy and photoluminescence spectroscopy. The results show that these polyhedrons with average particle size of 20 to 100 nm represent typical single crystal structures. The photoluminescence (PL) measurements reveal that polyhedron  $Y_{1-x}Dy_xVO_4$  crystals exhibit improved fluorescence intensity and crystallization derived from the perfect crystal structure of polyhedron annealed at higher temperature in contrast with the irregular nanoparticles, but the ratio of yellow ( ${}^4F_{9/2} \rightarrow {}^6H_{13/2}$ ) to blue ( ${}^4F_{9/2} \rightarrow {}^6H_{15/2}$ ) emissions and chromaticity of the as-obtained samples decrease with the increase of the anneal temperature.

**Key words:** hydrothermal synthesis;  $Y_{1-x}Dy_xVO_4$  polyhedron; photoluminescence

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