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Photocatalytic and Luminescent Properties of SrMoO₄ Phosphors Prepared via Hydrothermal Method with Different Stirring Speeds

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To probe the potential utilities in the photocatalyst and luminescent materials, a series of SrMoO₄ samples have been prepared via the hydrothermal preparation with different stirring speeds. These SrMoO₄ samples were characterized using X-ray diffraction analysis, scanning electron microscopy, UV-diffuse reflection spectroscopy (UV-vis). It has been found that the lattice parameters and [MoO₄] tetrahedron distortion of SrMoO₄ samples are increased with the increased stirring speed in the process of hydrothermal preparation. By changing the stirring speeds, spindle and succulent-like morphologies have been obtained. UV-vis results show that the band gaps of SrMoO₄ samples are sensitive to the stirring speed. As for the luminescent and photocatalytic properties, our experimental results clearly suggest that, compared with those samples without stirring, the luminescent and photocatalytic activities are enhanced with stirring in the hydrothermal preparation. The photodegradation of methyl blue (MB) over SrMoO₄ system increases from 30% to 50% with stirring, which may be related to small band gaps and porous surfaces. Our results indicate that stirring may be one important technique to improve the photocatalytic properties, especially in the process of hydrothermal method.

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