عنوان مقاله:

Simple co-precipitation method to synthesis of SrWO4 and novel silver-doped SrWO4 micro/nanostructures and their photocatalytic properties

محل انتشار:

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خلاصه مقاله:

Background and objective:Alkaline earth metal tungstants have attracted extensive interests because of their potential applications in various fields, such as optoelectronic industry, solid-state laser system, scintillator, photocatalysis, light emitting diodes, and energy storage materials. Over the years, many different routes were developed to obtain the SrWO4 nanostructures, for example: co-precipitation, electrochemical, sonochemical, hydrothermal process and cyclic-microwave. The low electrical conductivity, and high recombination rate of photogenerated electron-hole pair in SrWO4 nanostructures impede their practical applications. In order to resolve these problems can be used from deposition method of metallic nanoparticles.Herein, we will report the co-precipitation method for the synthesis of SrWO4 and a new Ag0-SrWO4 nanocomposite as photocatalyst material to achieve improved photocatalytic activity.Materials and methods: The SrWO4 nanostructures were synthesized by a new simplistic co-precipitation method. A typical synthesis procedure, Na2WO4 was dissolved in the Na(B(C6H5))/H2O mixture and Sr(NO3)2.3H2O solution at 70 °C for 15 min.The Ag0-SrWO4 nanocomposite was prepared as follows: the as-prepared SrWO4 nanopareticles were dissolved in the mixture of water and Na(B(C6H5)). Subsequently, AgNO3 solution was added to the above mixture. Then, the obtained gray powder was annealed at 500 °C for 1 h. The Photocatalytic activities of the SrWO4 nanostructure and Ag0-SrWO4 nanocomposite dissolved in water were measured by the decomposition of methyl orange dye under UV light illumination.Finding: In summary, SrWO4 and Ag0-SrWO4 microcrystals were successfully synthesized by co-precipitation method at 70° C for the first time. The Ag doped SrWO4 presents enhanced photocatalytic activity compared to pure SrWO4 from 52.2 to 92.03% in 100 min under UV light irradiation.Conclusion:In the XRD patterns of samples (Fig. 1), only the tetragonal SrWO4 phase were observed, that confirms the incorporation of the dopant Ag+ ion into the SrWO4 matrix.

کلمات کلیدی:

SrWO4; Photocatalysis; Co-precipitation.

لینک ثابت مقاله در پایگاه سیویلیکا: