

Surfactant-free hydrothermal synthesis, growth mechanism and photocatalytic properties of PbMoO_4 polyhedron microcrystals

Objective

Propose and work with a cheaper way to synthesize PbMoO_4 crystals without using surfactants. Prove the photocatalytic activity of the resulting compound and characterize its properties, such as, morphology and phase.

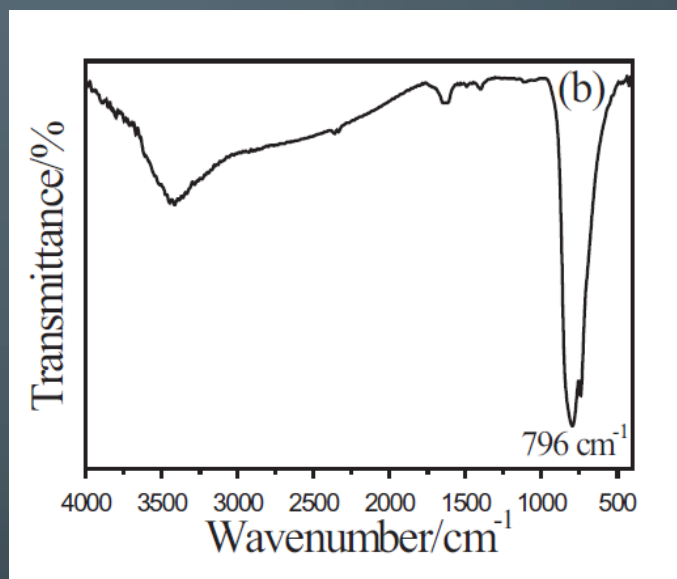
Sample preparation

First, 0.001 mol of $\text{Pb}(\text{NO}_3)_2$ and $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$ were dissolved separately both in 5 mL of deionized water and the first also in 20 mL of glycerol. The $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$ was slowly dropped into the first solution. The final solution was stirred for 10 min and transferred into a stainless-steel autoclave with a Teflon liner. It was at 180 °C for 24 h, then cooled to room temperature. The collected product was washed, then dried in with a yield of 90%.

Data acquisition conditions

"FT-IR spectrum was recorded for KBr-diluted samples using a Nicolet Magna 750 IR spectrometer at wavenumbers 400–4000 cm^{-1} "

Representative figure /results



"Transmittance FTIR spectrum of PbMoO_4 polyhedron microcrystals at 180 °C for 24 h. Only the strong transmittance mode is observed at 720–900 cm^{-1} , which can be specified as the Mo–O anti-symmetric stretching vibration of the $[\text{MoO}_4]_2$ tetrahedrons."

Reference

L. Zhang, D. Bai, M. Zhou, and C. Pan, "Surfactant-free hydrothermal synthesis, growth mechanism and photocatalytic properties of PbMoO_4 polyhedron microcrystals", Journal of Saudi Chemical Society, vol. 21, S275–S282, 2017, issn: 1319-6103.
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Chemistry (miscellaneous)

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