THE ENHANCED PHOTOCATALYTIC PROPERTIES OF SILVER PHOSPHATE SYNTHESIZED UNDER MANGOSTEEN PEEL EXTRACT SOLUTION

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Abstract	The synthesis of silver phosphate (Ag3PO4) photocatalyst has been widely developed for organic pollutant degradation. However, the large particle of this photocatalyst limits the photocatalytic activity. The smaller particle size of the Ag3PO4 photocatalyst was successfully prepared using the starting material of AgNO3 and Na2HPO4.12H(2)O under mangosteen peel extract solution. The starting materials were dissolved in mangosteen peel extract solutions prepared at the concentration of 1% (w/v). The reaction of silver nitrate and phosphate solution was conducted at room temperature. The samples of pristine Ag3PO4 and Ag3PO4 prepared under mangosteen peel extract were studied using XRD, DRS, SEM, BET, and FTIR. All photocatalytic activities were evaluated using Rhodamine B photooxidation under blue light irradiation (LED, 3 Watt). The results showed that the mangosteen peel extract significantly decreased the particle size, lowered the bandgap energy from 2.12 to 2.00 eV, and increased the crystallinity of Ag3PO4. The interaction of xanthones from mangosteen peel extract solution with silver ion might affect the growth particle of Ag3PO4, and inhibit the agglomeration leading to small particle size, more uniform distribution, high crystallinity, and low bandgap energy. These properties enhanced the photocatalytic activity up to 2.9 times higher compared to the sample without the treatment of mangosteen peel extract.
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