The enhanced photo-stability of defective Ag3PO4 tetrahedron prepared using tripolyphosphate

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Abstract	Ag3PO4 is an excellent photocatalyst under visible light irradiation. However, the low stability due to photo-corrosion is still an obstacle in its application. It is a big challenge to improve stability using synthesis modification. Here, the photocatalyst stability enhancement was success-fully prepared by tripolyphosphate. Photocatalyst was prepared by reacting AgNO3 solution with STPP (sodium tripolyphosphate) solution to form a white suspension. The addition of phosphate solution to the white suspension produces yellow Ag3PO4 with a new type of defective photocata-lyst. The XPS measurement showed that the increase of STPP concentration significantly decreased the Ag/P atomic ratio, indicating the silver vacancy formation on the surface of Ag3PO4. The pho-tocatalytic reaction formed a metallic Ag with a lower d-space in the cube structure occurred in the silver vacancy of Ag3PO4. This defect increases the interaction of metallic silver and Ag3PO4. The enhanced photo-stability might be induced by metallic silver that can act as a photogenerated electron acceptor.(c) 2022 The Author(s). Published by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
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