Highly Efficient Visible-Light-Driven Photocatalytic Activities in Synthetic Ordered Monoclinic BiVO₄ Quantum Tubes-Graphene Nanocomposites

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Figure S1. Schematic crystal structure of monoclinic BiVO₄. The structure of m-BiVO₄ consists of corner-sharing BiO₈ dodecahedra and VO₄ tetrahedra. The presence of a Bi–O dodecahedral distortion due to the 6s² lone pair of Bi³⁺ and a calculated band gap of 2.2 eV makes it suitable for a visible-light-driven photocatalyst, with the potential applications in purifying polluted water resources.
Figure S2. (a) Concentration change curves of dye molecules over pure graphene, P25, bulk BiVO₄, monoclinic BiVO₄ quantum tubes and ordered monoclinic BiVO₄ quantum tubes-graphene nanocomposites under dark, taking the rhodamine B as an example; TEM images of ordered monoclinic BiVO₄ quantum tubes-graphene nanocomposites after visible-light photodegradation of (b) rhodamine B molecules, (c) methylene blue molecules and (d) methyl orange molecules.

Figure S2a shows the concentration change curves of dye molecules in the dark over pure graphene, P25, bulk BiVO₄, monoclinic BiVO₄ quantum tubes and ordered monoclinic BiVO₄ quantum tubes-graphene nanocomposites, taking the rhodamine B as an example. As displayed in Figure S2a, one can clearly see that there are no obvious differences in the adsorbance of rhodamine B among the above five materials, inferring that the process of adsorption equilibrium in dark do not have an apparent influence on the estimation of their photocatalytic properties. Figures S2b, c and d
depict the TEM images of ordered monoclinic BiVO$_4$ quantum tubes-graphene nanocomposites after visible-light photodegradation of rhodamine B, methylene blue and methyl orange. Obviously, the morphologies of ordered monoclinic BiVO$_4$ quantum tubes-graphene nanocomposites in Figures S2b-d have no obvious variations after the measurement of photocatalytic properties, clearly revealing their excellent durability.