

PbBi₂Nb₂O₉ as a novel oxide photocatalyst for water splitting and isopropyl alcohol degradation working under visible light

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Despite immense research effort of late and an imminent societal need for future energy and environmental technologies, photocatalysts that could utilize the visible light have been limited to a small number of the cation or anion-modified transition metal oxides. Even these materials have failed to demonstrate their technical viability due to low quantum yields or limited catalyst stability. In search of novel oxide materials with good activity under visible light, we discovered that PbBi₂Nb₂O₉, an Aurivillius phase-type perovskite, with a band gap energy of 2.88eV (431nm), was an efficient photocatalyst for both water splitting into O₂ or H₂, and isopropyl alcohol degradation to CO₂ under visible light irradiation (420nm).