# Nitrogen-Doped ZnO/MgO(111) Nanocomposite for High Efficient and Stable Photocatalytic Hydrogen Evolution Under Visible Light

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ZnO-based photocatalyst has attracted considerable spotlight as an efficient photocatalyst for hydrogen evolution in the past decades due to its low cost, abundance, outstanding stability, high quantum efficiency, favorable bandgap, and its photocatalytic mechanisms. ZnO nanoparticles as a photocatalyst for hydrogen evolutions brought by high-energy UV light have been well studied. However, only approximately 5 percent of the solar ultraviolet radiation penetrates the atmosphere. Hence, the extensive research in ZnO-based semiconductors promoted by visible light leads to the development in the use of photocatalyst for hydrogen evolution is required. Here we report a facial two-step process synthesis of N-doped ZnO/MgO(111) nanocomposite for high efficient and stable photocatalytic hydrogen evolution under simulated sunlight. The catalyst has a superior hydrogen evolution rate as high as ca. 1800 μmol $g^{-1}$ $h^{-1}$ under 100 mW $cm^{-2}$ visible light intensity, which is one of the highest values ever reported for ZnO-based visible-light-responsive photocatalytic activity.