Nanoworm BiVO₄ Photoelectrochemical Sensor Prepared by a Cyanuric-Chloride-Assisted Sol-Gel Process and Its Sensing Property for Ascorbic Acid

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A nanoworm BiVO₄ photoanode was successfully synthesized by sol-gel drop-casting for the determination of ascorbic acid. The structure and surface morphology of the obtained samples were characterized, and their photoelectrochemical properties and sensing performance towards ascorbic acid were investigated. The precursor solids were also investigated, and the results proved that cyanuric chloride, which was bound with other precursors, generated the nanoworm morphology. The nanoworm BiVO₄ photoanode enhanced the photocurrent density and exhibited a sensitivity of 68.9 $\mu\text{A mM}^{-1} \text{cm}^{-2}$ towards ascorbic acid with high selectivity under visible light illumination.

Keywords: BiVO₄ photoanode, Nanoworm, Sol-gel method, Cyanuric chloride, Photoelectrochemical sensor, Ascorbic acid.

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