

Supporting information for

Nickel-Zinc Hydroxide-Orchestrated Nitrogen-Doped Carbon/ Bismuth Vanadate Nanosheet Aerogels Power 24 Hour Solar- to-Hydrogen Systems

Ruhua Zha,¹ Zhen Zhang,¹ Yang Zhang,¹ QingCheng Wang,¹ Liu He,² Tuo Shi³ and Min Zhang^{1,*}

¹School of Chemistry and Materials Engineering, Fuyang Normal University, Fuyang, Anhui, 236037, China

²Department of Medicinal Chemistry, Virginia Commonwealth University, Richmond, Virginia, USA

³Key Laboratory of Microelectronic Devices and Integrated Technology, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, 100029, China

*Email: zm201177055@sina.com (Min Zhang)

DOI: <https://dx.doi.org/10.30919/es1887>

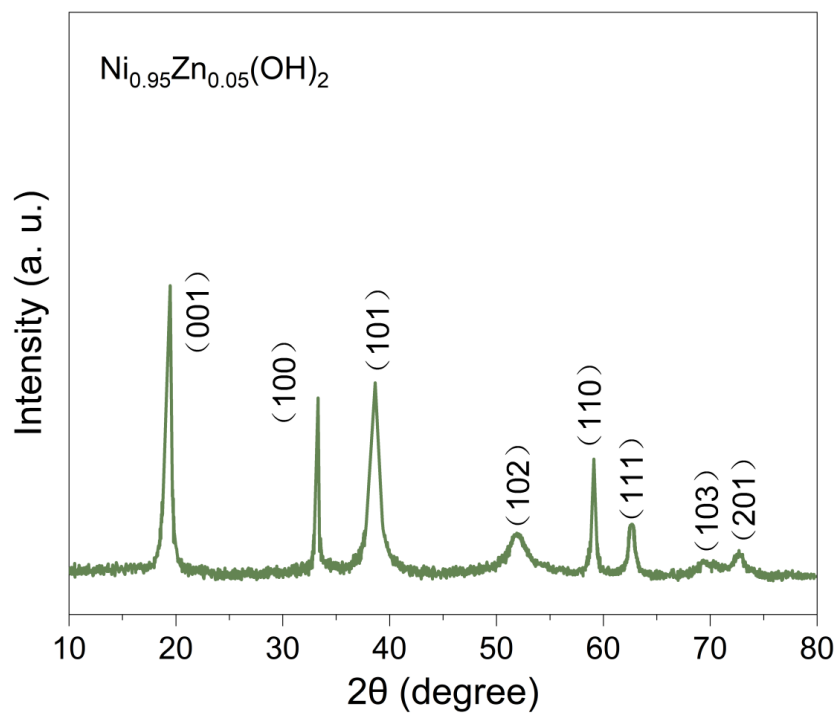


Fig. S1: XRD pattern of $\text{Ni}_{0.95}\text{Zn}_{0.05}(\text{OH})_{2.0}$ nanoparticles.

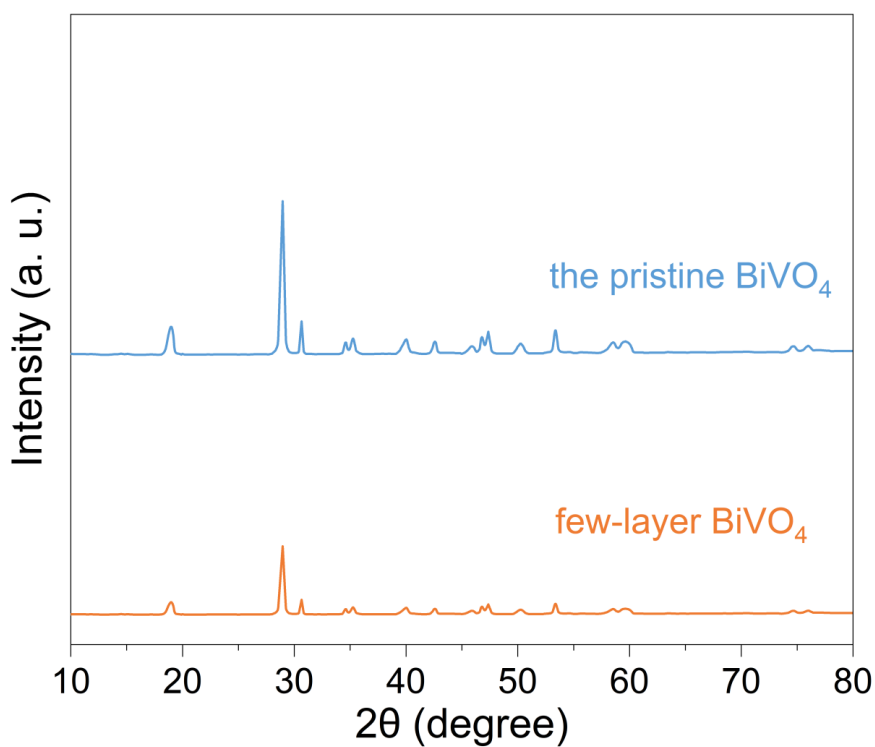


Fig. S2: XRD patterns of the bulk BiVO_4 (a) and the pristine few-layer BiVO_4 (b).

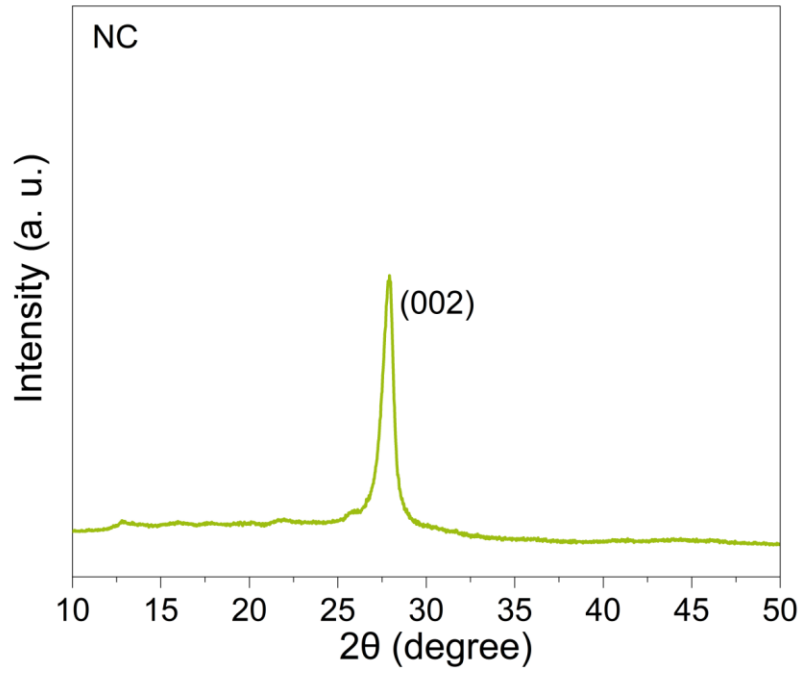


Fig. S3: XRD pattern of the pristine NC.

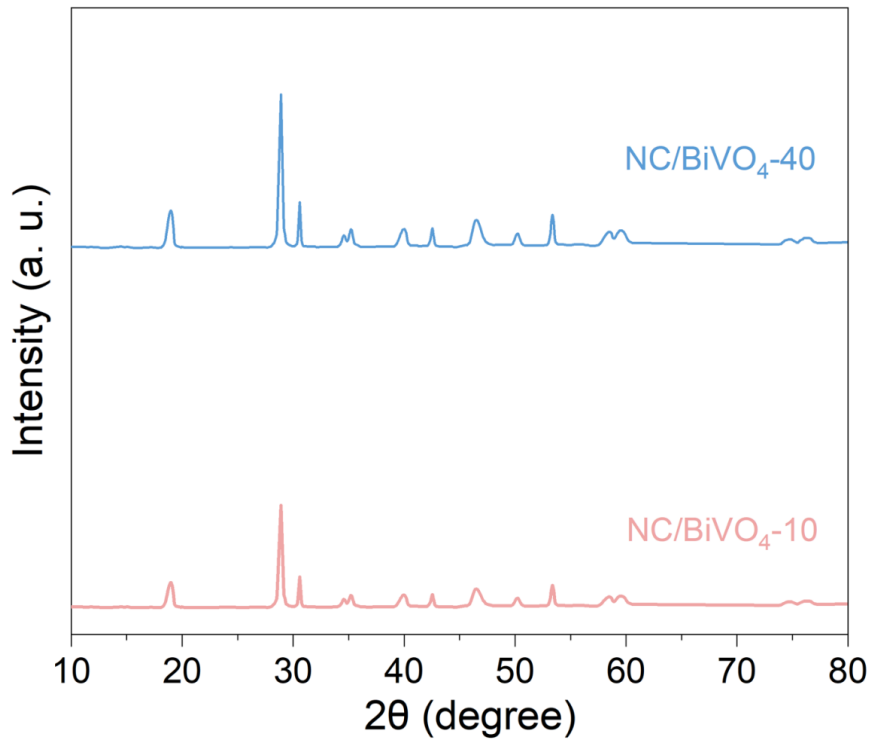


Fig. S4: XRD patterns of NC/BiVO₄-10 and NC/BiVO₄-40.

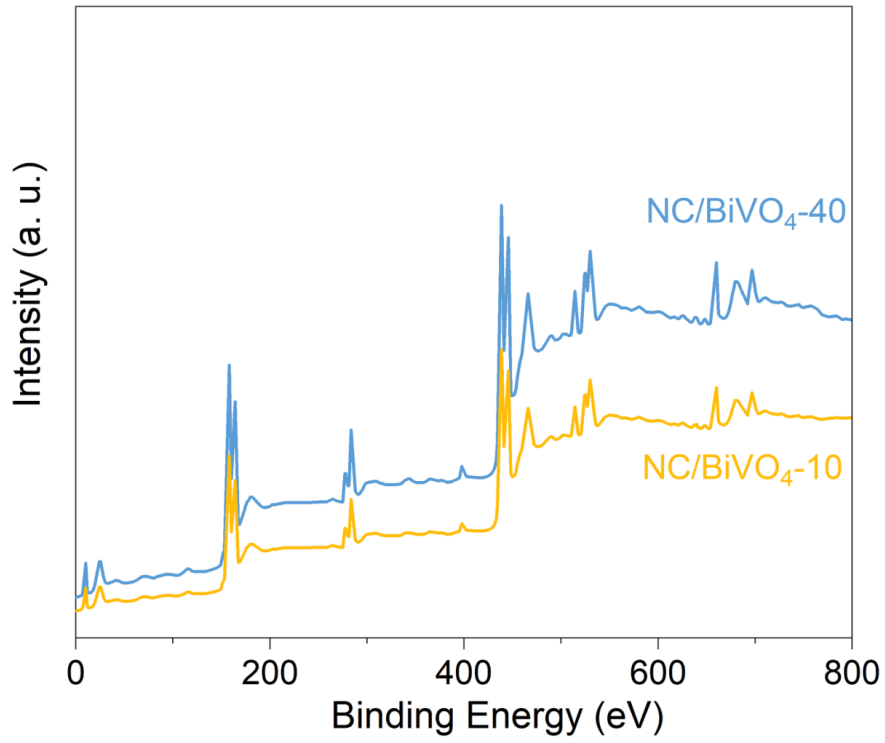


Fig. S5: The survey XPS spectra of NC/BiVO₄-10 and NC/BiVO₄-40.

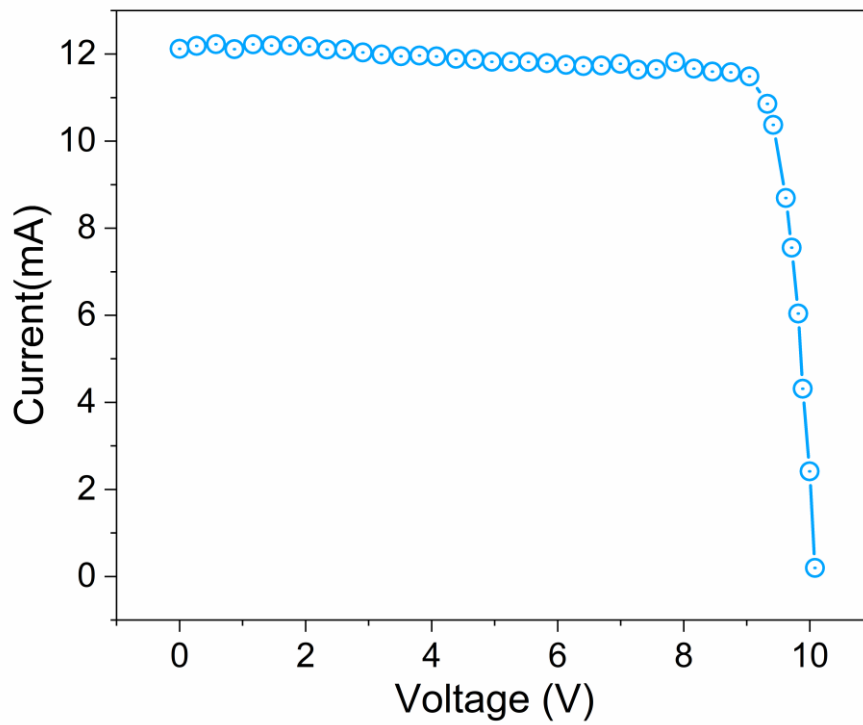


Fig. S6: Current-voltage relationship of PERC under AM 1.5 illumination.

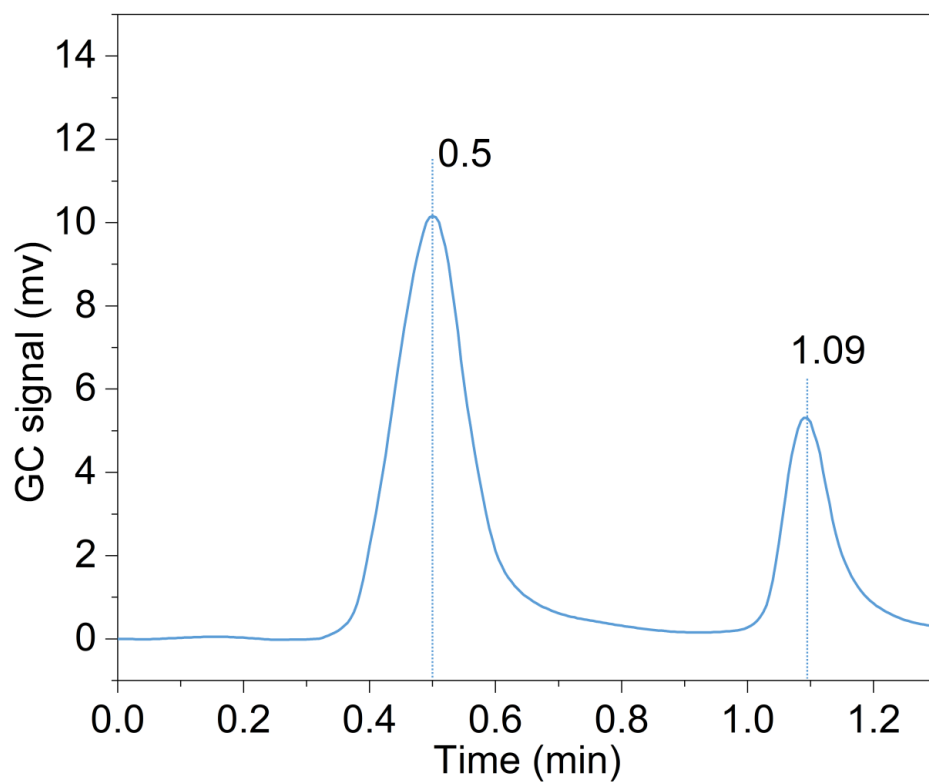


Fig. S7: The detection of the evolved hydrogen and oxygen by gas chromatograph.

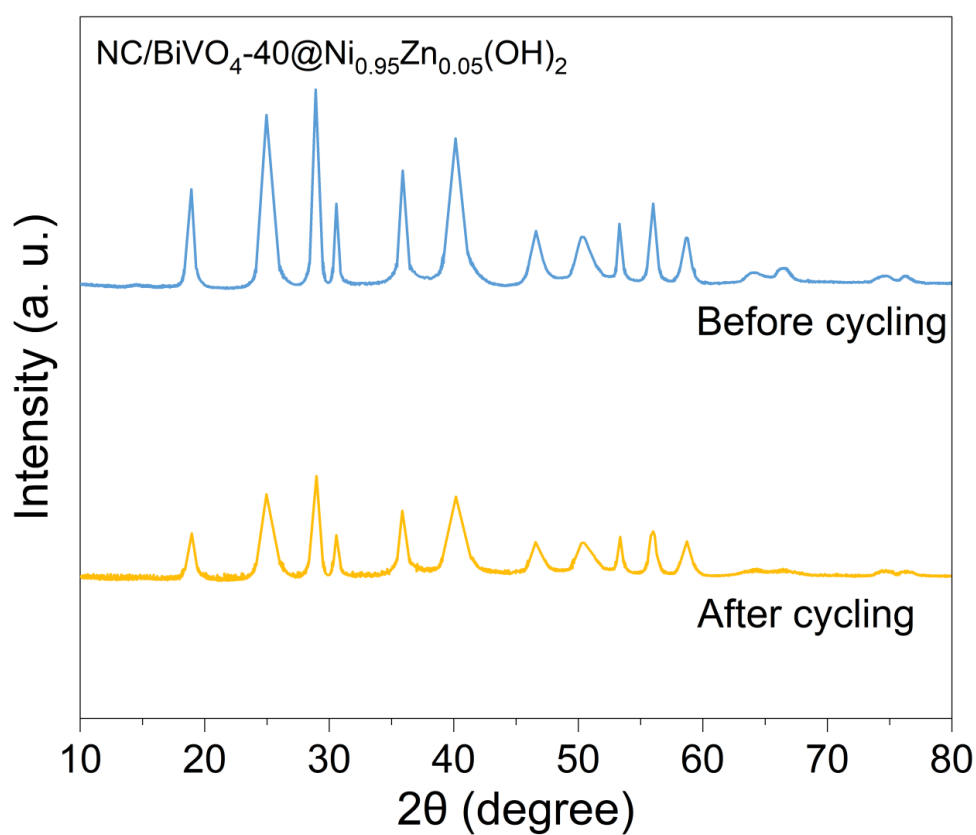


Fig. S8: XRD patterns of the NC/BiVO₄-40@Ni_{0.95}Zn_{0.05}(OH)_{2.0} aerogel catalyst before and after 30 cycles of photocatalytic water splitting.

Table S1: Quantitative strength recovery ratio of the aerogels after different numbers of compression cycles.

Cycle Number	NC/BiVO ₄ -10@Ni _{0.95} Zn _{0.05} (OH) _{2.0} Strength Recovery (%)	NC/BiVO ₄ -40@Ni _{0.95} Zn _{0.05} (OH) _{2.0} Strength Recovery (%)
1	100.0	100.0
10	98.7	99.1
20	97.5	98.2
30	96.8	97.5
40	96.1	96.9
50	95.4	96.2

Publisher's Note: Engineered Science Publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Open Access

This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International, which permits the use, sharing, adaptation, distribution and reproduction in any medium or format, as long as appropriate credit to the original author(s) and the source is given by providing a link to the Creative Commons license. This usage for commercial purposes is not allowed. If modifications, adaptations or any other transformation were made, it is not allowed for distribution. The images or other third-party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

© The Author(s) 2025.