

## Supplementary Information

# Optical and Electronic Configuration of a Novel Semiconductor -Silver Nitroprusside for Enhanced Electrocatalytic and Photocatalytic Performance

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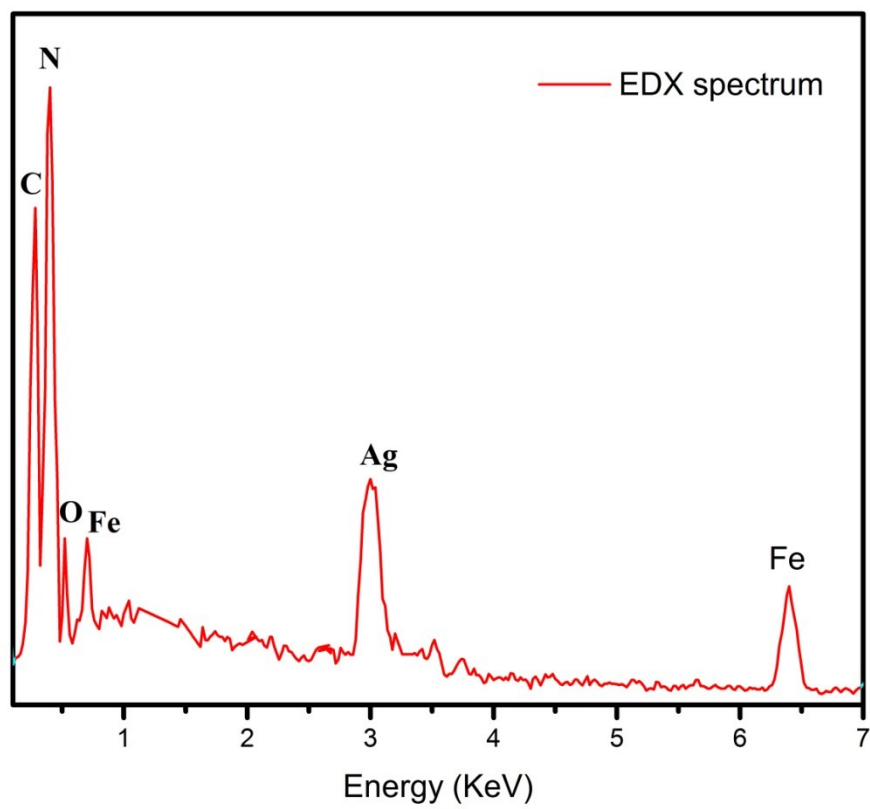


Fig. S1: EDX pattern of SINP

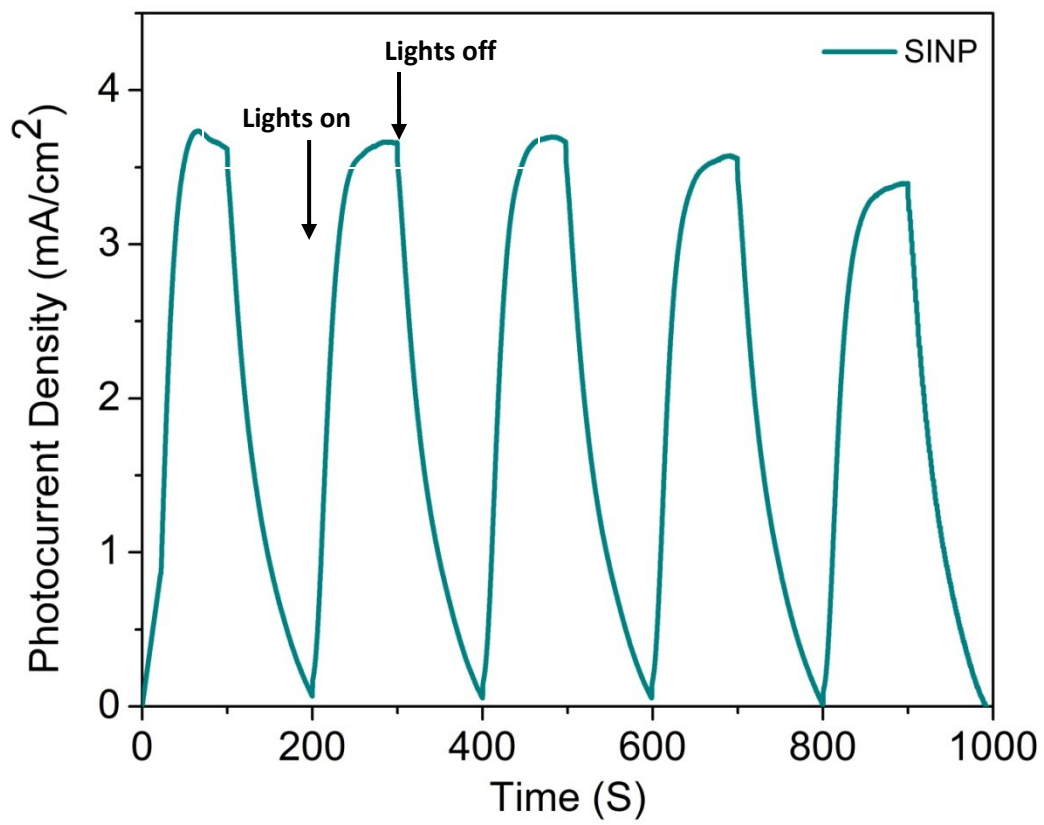


Fig. S2: Photocurrent Vs Time

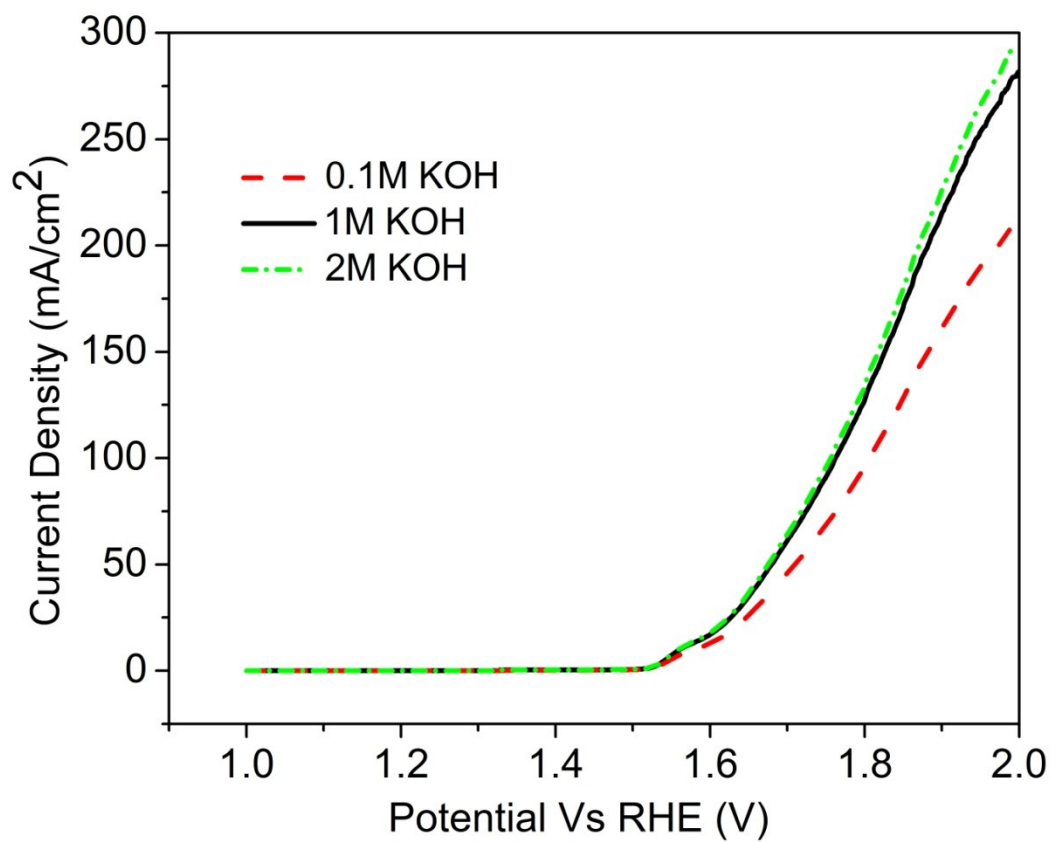


Fig. S3: OER polarization at different KOH concentration

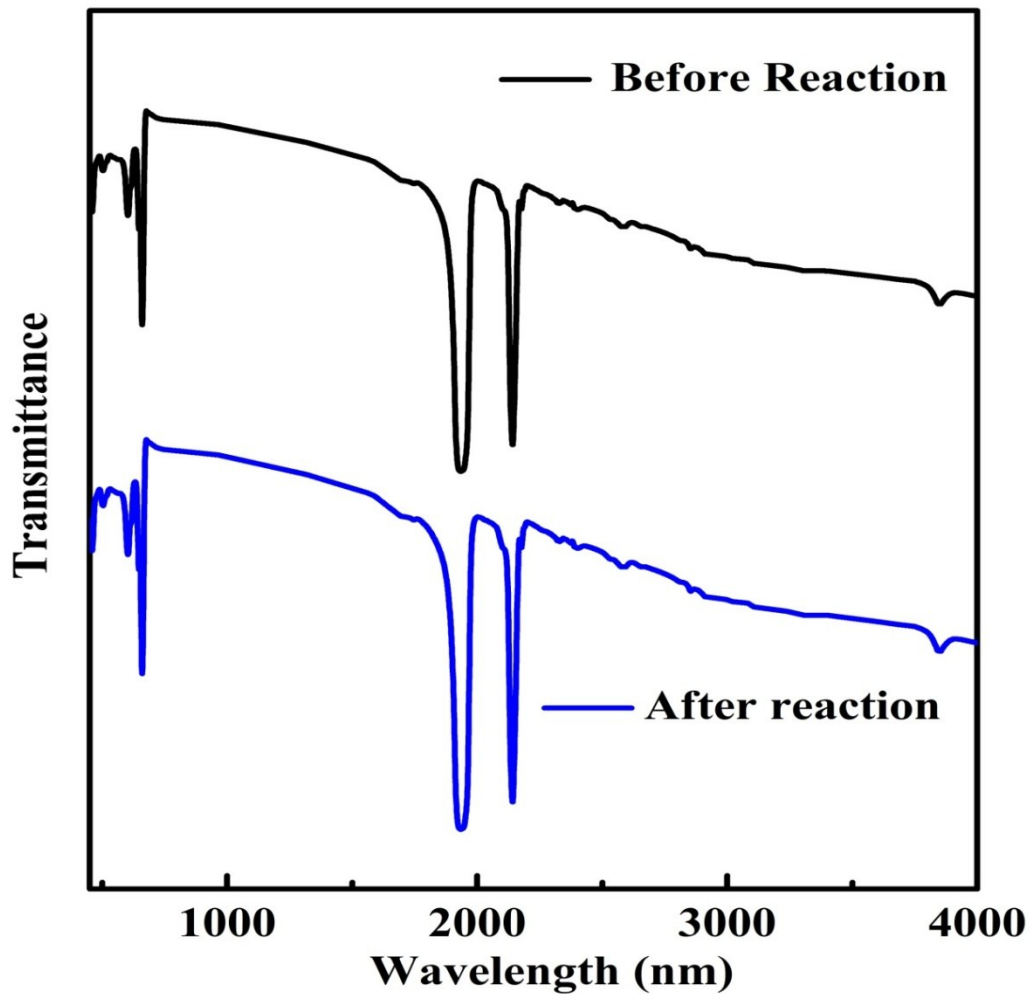


Fig. S4: FTIR spectrum before and after reaction

FTIR band at 2170, 2147, 1932, 451, 513, 646, 661  $\text{cm}^{-1}$  significant for  $\nu(\text{CN})_{\text{ax}}$ ,  $\nu(\text{CN})_{\text{eq}}$ ,  $\nu(\text{NO})$ ,  $\nu(\text{FeC})$ ,  $\nu(\text{FeCN})_{\text{eq.}+\text{ax}}$ ,  $\nu(\text{FeN})$ ,  $\nu(\text{FeNO})$  vibration respectively, are consistent after MO degradation. Catalyst stability and reliability can be confirmed by this analysis<sup>1</sup>.

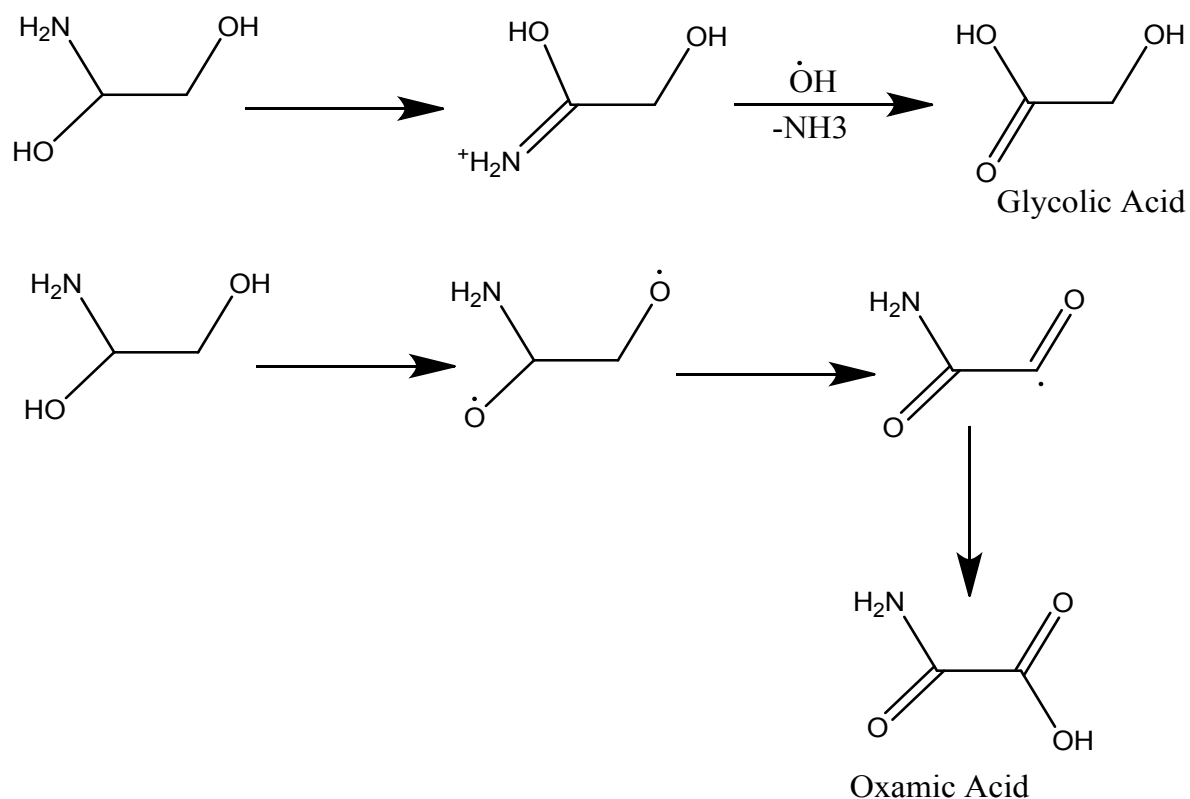


Fig. S5: Schematic mechanism of 2 amino 2 hydroxyethanol degradation

### Synthesis of Ag<sub>3</sub>PO<sub>4</sub> and BiVO<sub>4</sub>

Ag<sub>3</sub>PO<sub>4</sub> and BiVO<sub>4</sub> were synthesized according to previously declared precipitation<sup>2</sup> and hydrothermal route respectively.<sup>3</sup>

1. Rodriguez-Hernandez, J.; Reguera, L.; Lemus-Santana, A.; Reguera, E. Silver nitroprusside: Atypical coordination within the metal nitroprussides series. *Inorganica Chimica Acta* 2015, 428, 51-56.
2. Yi, Z.; Ye, J.; Kikugawa, N. An orthophosphate semiconductor with photooxidation properties under visible-light irradiation. *Nature Materials*. 2010, 9, 559-564.
3. Tachikawa, T.; Ochi, T.; Kobori, Y. Crystal-Face-Dependent Charge Dynamics on a BiVO<sub>4</sub> Photocatalyst Revealed by Single-Particle Spectroelectrochemistry. *ACS Catal.* 2016, 6, 2250–2256