Supplementary Information

Selective synthesis of visible light active $\gamma$-Bismuth Molybdate nanoparticles for efficient photocatalytic degradation of methylene blue, reduction of 4-nitrophenol and antimicrobial activity

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SI. 1: Agar media preparation

The Mueller Hinton agar medium was used for bacteria development due to its acceptable reproducibility and satisfactory growth of most pathogens. Typically, the agar medium was prepared by dissolving synthetic Mueller-Hinton agar powder in distilled water. The medium was adjusted to pH=7 with 1N NaOH and made up to 1L. The medium and Petri plates (100 mm x 15 mm) were autoclaved at 121 °C, 15 lbs for 20 min. The autoclaved medium was allowed to cool to 45 °C and transferred into Petri plates (20 ml/plate) under disinfected conditions of laminar air-flow.

SI.2: Antimicrobial Activity for Agar-well diffusion method

The antimicrobial activity of synthesized $\text{g-Bi}_2\text{MoO}_6$ NP’s was carried out by using the Agar-Well diffusion method. The medium was sterilized by autoclaving at 120 °C (15lb/in²). About
20 mL of the nutrient agar medium/potato agar seeded with the respective strains bacteria/fungal were transferred aseptically into each sterilized Petri plate. The plates were left at room temperature for solidification. In each plate, a single well of 6 mm diameter was made using a sterile borer. The test compounds were freshly reconstituted with suitable solvents (DMSO) and tested at various concentrations (10 mg/ml, 5 mg/ml, 2.5 mg/ml). The samples and the control along with standard (Ciprofloxacin - Antibiotic drug, Clotrimazole – Antifungal drug) were placed in 6 mm diameter well. In antimicrobial assays, fungal plates were incubated at 28±2°C while 37±2°C for bacteria. Standard with 10 mg/ml was used as a positive control for antimicrobial activity. The diameter of the zone of inhibition was measured using the Himedia antibiotic zone scale.

Fig S1: The reduction of 4-NP by BaBH₄.
| Micro-organism                  | Zone inhibition (mm) |   |   |   |   |
|--------------------------------|----------------------|---|---|---|---|
|                                | Catalyst Concentration |   |   |   |   |
|                                | 10mg/ml  | 5mg/ml  | 2.5mg/ml | Standard (reference) 10mg/ml | DMSO (solvent) 1ml |
| *Escherichia Coli* – Gram negative | 10        | 10       | 9        | 35                        | 0                |
| *Staphylococcus aureus* – Gram positive | 10        | 12       | 10       | 40                        | 0                |
| *Aspergillus niger*            | 18        | 11       | 10       | 31                        | 0                |