Electronic Supplementary Information (ESI)

## Ultrafine Au Nanoparticles Anchored on Bi<sub>2</sub>MoO<sub>6</sub> with Abundant

## Surface Oxygen Vacancies for Efficient Oxygen Molecule Activation

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**Fig. S1** XPS spectra of BMO, Au/BMO-B was before calcined and BMO-A was calcined at 250°C for 2 h. (a)The survey spectra and the high resolution XPS spectra of the sample, (b)Mo 3*d* and (c) Au 4f for 4wt% Au/BMO was before and after calcination.



**Fig. S2** FE-SEM images of (a,b) 1wt% Au/BMO, (c,d) 2wt% Au/BMO,(e,f) 4wt% Au/BMO, and (g, h) 6wt% Au/BMO heterostructures.



**Fig. S3** Photocatalytic degradation activity of phenol over BMO, 4wt%BMO-PR, BMO-A, and wt%BMO-PR under visible light illumination



Fig. S4 Mott-Schottky plots of (a) BMO and (b) Au/BMO samples.



Fig. S5 Valence band XPS spectra of (a) BMO and (b) Au/BMO.



Fig. S6 Band diagram of BMO and Au/BMO.