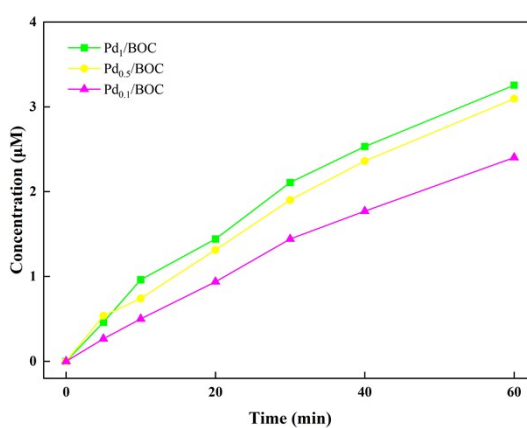
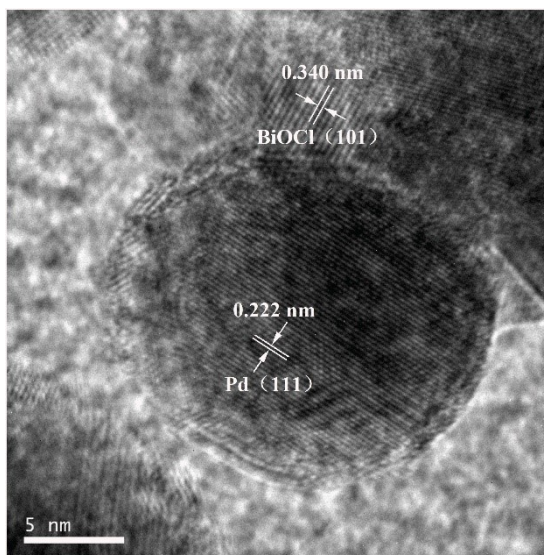


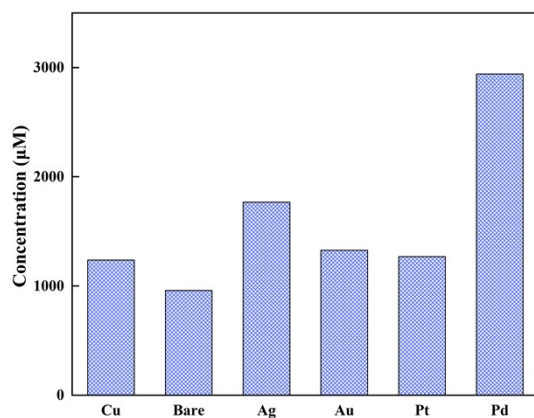
**Fig. S1** Valence-band XPS spectra of Pd/BOC and Pd/3PEI/BOC.



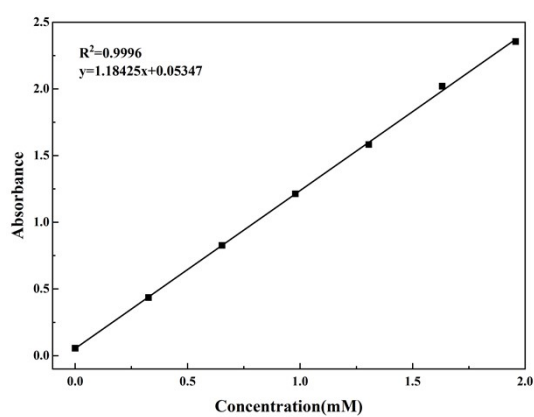
**Fig. S2** Photocatalytic activity for Pd<sub>0.1</sub>/BOC, Pd<sub>0.5</sub>/BOC and Pd<sub>1.0</sub>/BOC.



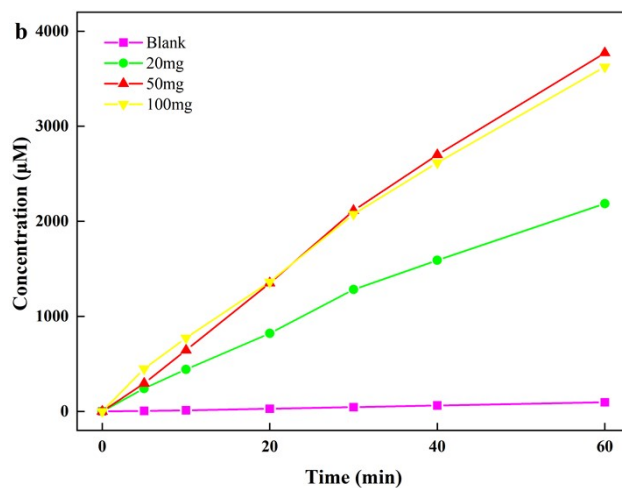
**Fig. S3** HRTEM image of Pd/BOC.



**Fig. S4** Photocatalytic activity of metal species (0.5 wt%) loaded on BiOCl.



**Fig. S5** The linear fitting formula of standard  $H_2O_2$  concentration.



**Fig. S6** Photocatalytic  $H_2O_2$  production with different masses of Pd/3PEI/BOC.