

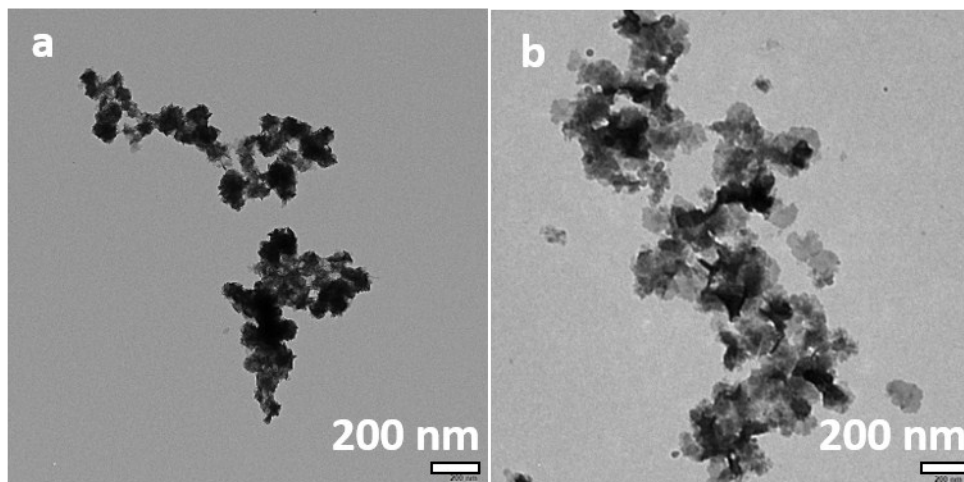
## Supporting Information

### **Synthesis of BiOCl<sub>x</sub>Br<sub>1-x</sub> nanostructure photocatalyst with high surface area for enhanced visible-light photocatalytic reduction of Cr(VI)**

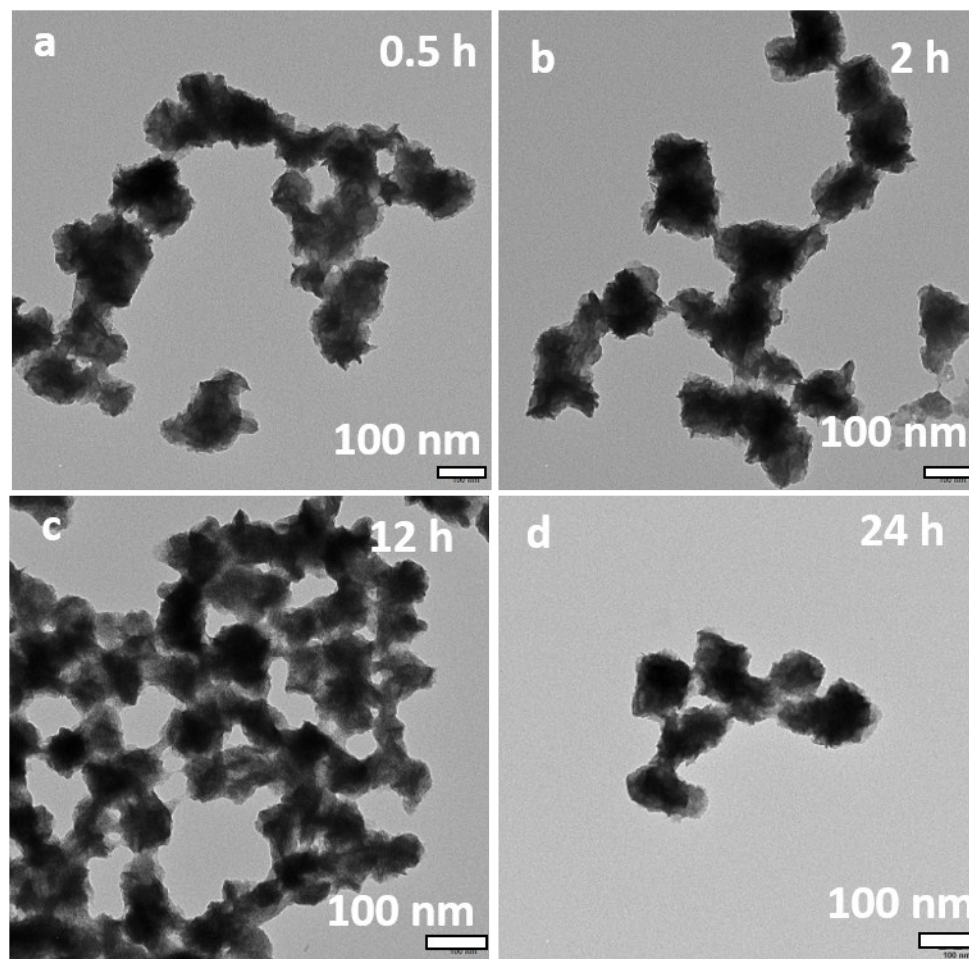
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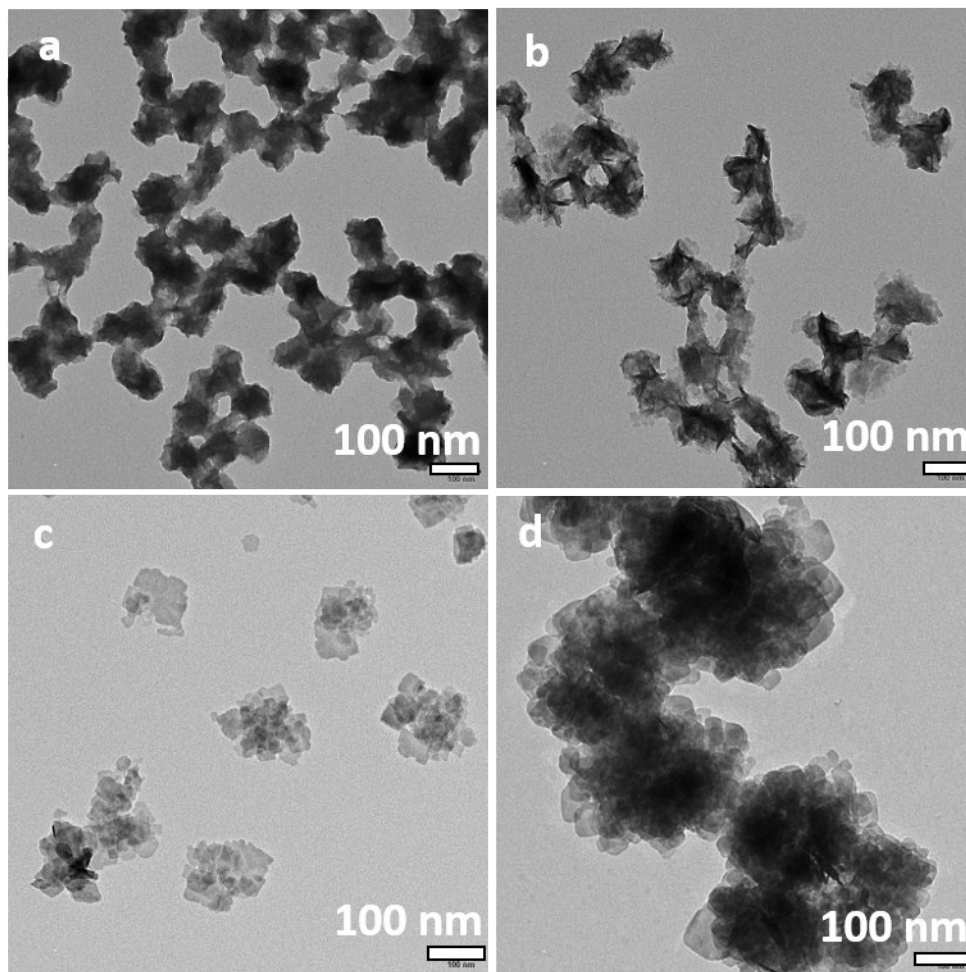
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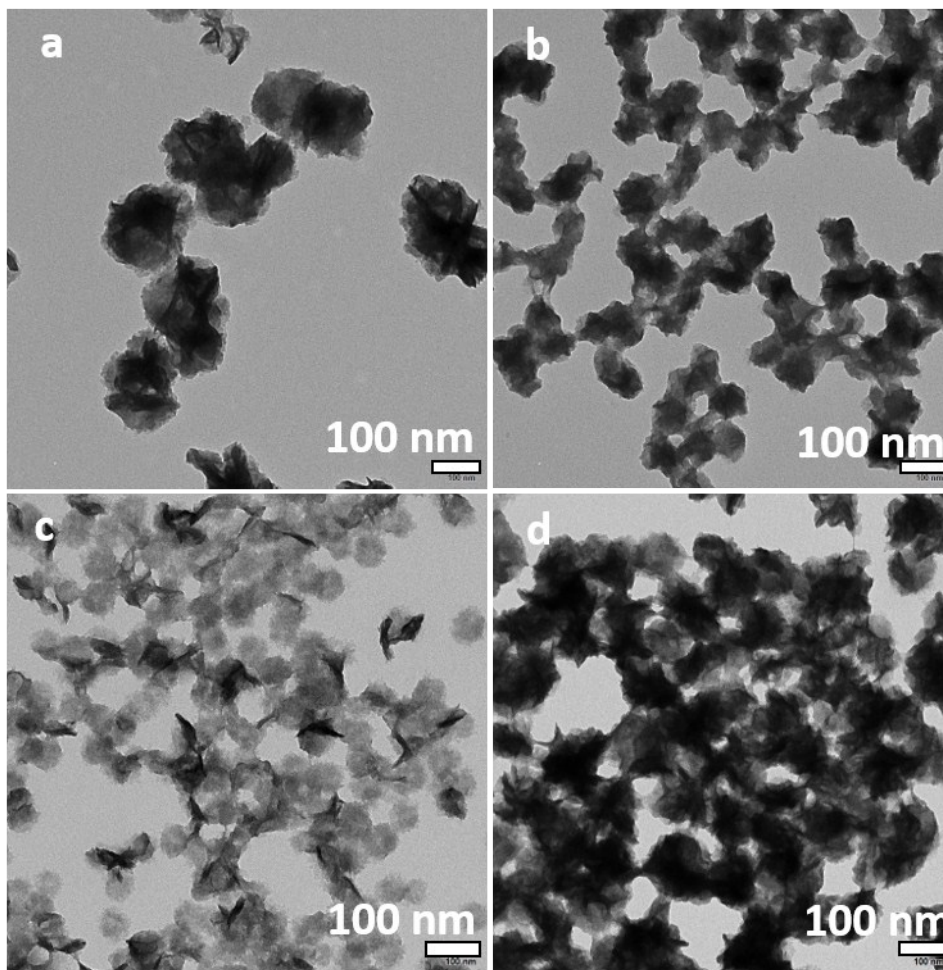
**Fig. S1.** (a) and (b) TEM images of BiOCl and BiOBr separately.



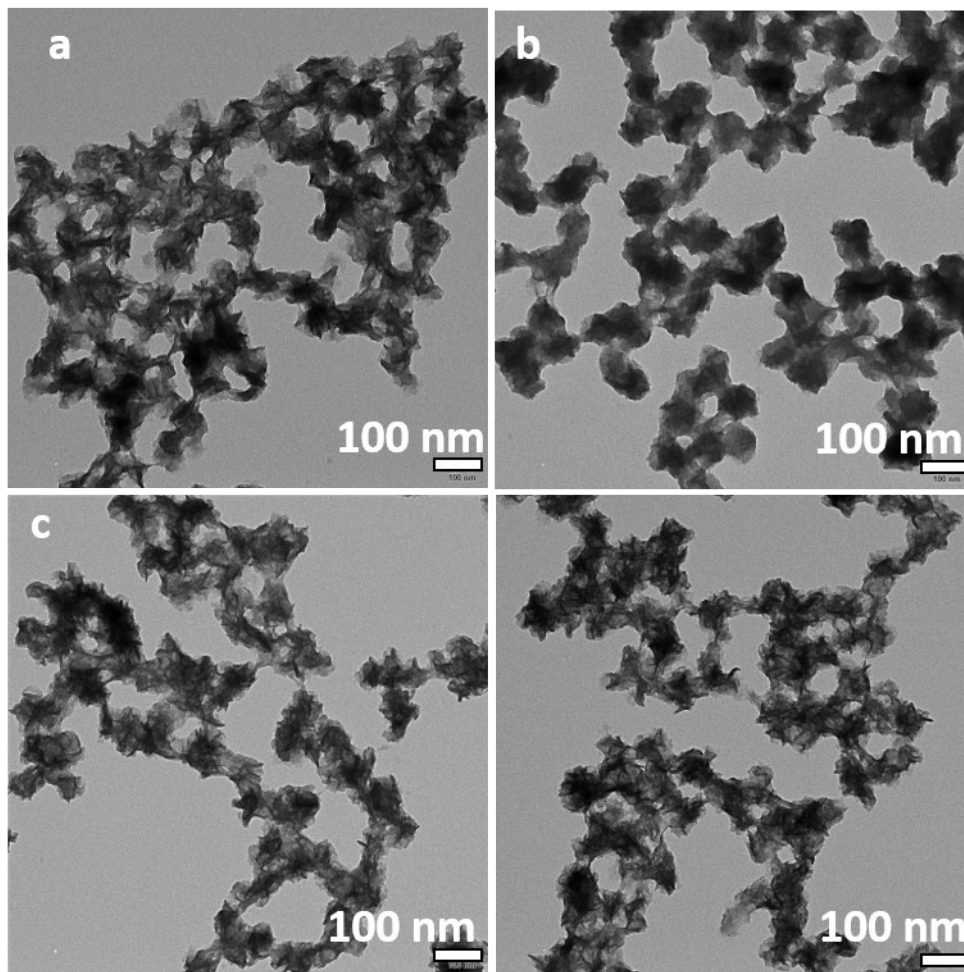
**Fig. S2.** (a), (b), (c) and (d) TEM images of  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  after 0.5, 2, 12 and 24 hours respectively.



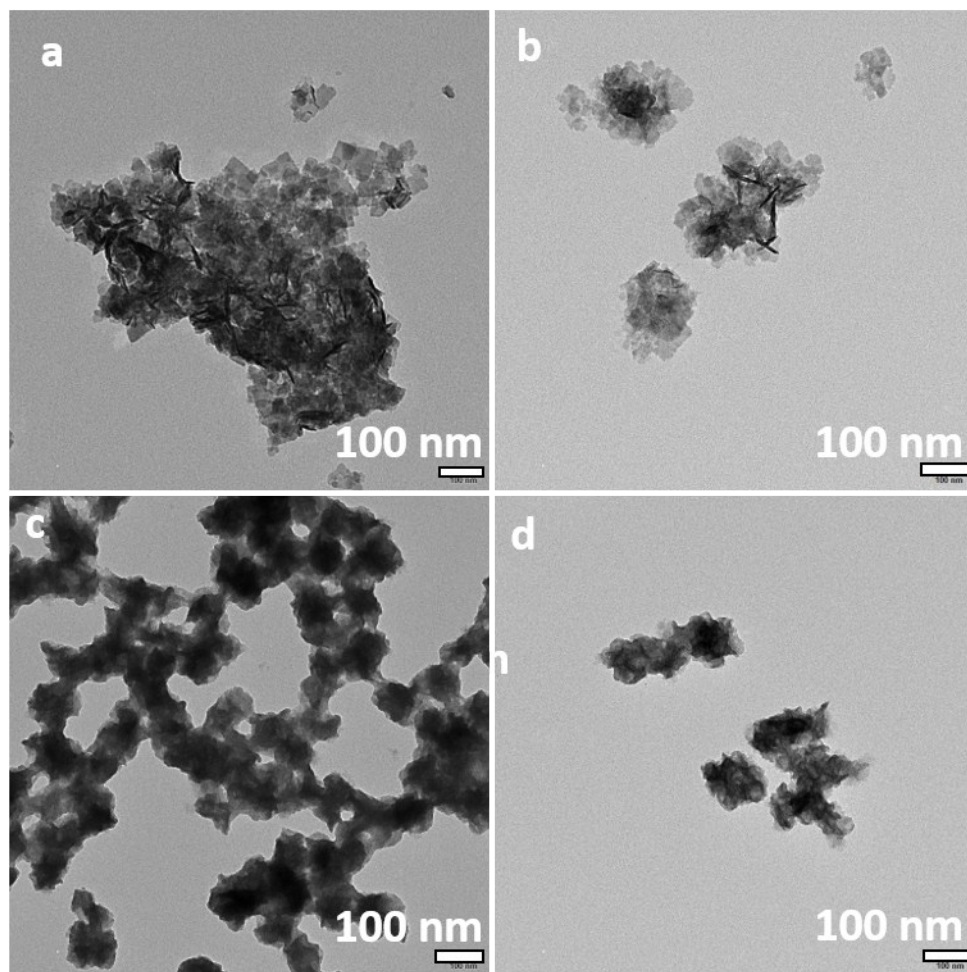
**Fig. S3.** (a), (b), (c) and (d) TEM images of BiOCl<sub>0.8</sub>Br<sub>0.2</sub> at different temperature e. g. 25, 50, 75 and 100 °C respectively.



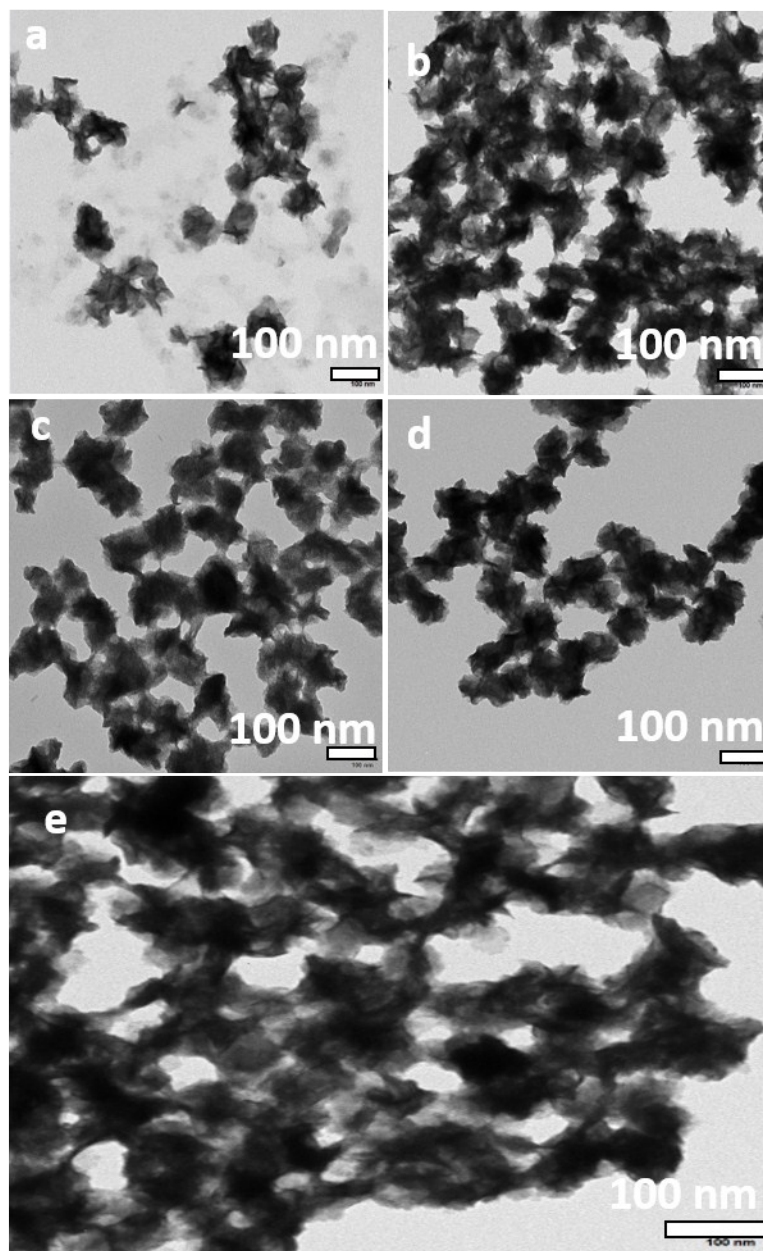
**Fig. S4.** (a), (b), (c) and (d) TEM images of  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  for different ratios of the solvent e. g. EG,  $\text{H}_2\text{O}$  (0:1), (1:1) (0.75:0.25) and (0.25:0.75) respectively.



**Fig. S5.** (a), (b), (c) and (d) TEM images of  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  for different concentration of Bismuth e. g. 2.5, 5, 7.5 and 10 mM respectively.



**Fig. S6.** (a), (b), (c) and (d) TEM images of  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  for different value of PVP e. g. 1, 2.5, 5, 10 mM respectively.



**Figure. S7.** (a), (b), (c), (d) and (e) TEM images of  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  for different value of Cl and Br ion e. g.  $\text{BiOCl}_{0.2}\text{Br}_{0.8}$ ,  $\text{BiOCl}_{0.4}\text{Br}_{0.6}$ ,  $\text{BiOCl}_{0.5}\text{Br}_{0.5}$ ,  $\text{BiOCl}_{0.6}\text{Br}_{0.4}$  and  $\text{BiOCl}_{0.8}\text{Br}_{0.2}$  respectively.