Electronic Supplementary Information (ESI)

In-situ construction of 2D/2D heterostructured $ZnIn_2S_4/Bi_2MoO_6$ Z-scheme system for boosting the photoreduction activity of Cr(VI)

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S1. Reagents

Bismuth nitrate pentahydrate (AR 99%) ($Bi(NO_3)\cdot 5H_2O$) and ethanol absolute (AR) were purchased from Sinopharm Chemical Reagent Co., Ltd. Analytical grade sodium molybdate dehydrate ($Na_2MoO_4\cdot 2H_2O$), Zinc acetate dihydrate ($Zn(Ac)_2\cdot 2H_2O$), Indium nitrate hydrate($In(NO_3)_3\cdot xH_2O$), hexadecyl trimethyl ammonium bromideande (CTAB), ethylene glycol (EG) and thioacetamide (TAA) were purchased from Aladdin Industrial corporation.. All chemicals were used as received, unless otherwise stated. Deionized water was prepared with a Milli-Q puritysystem (18.2 MΩ).

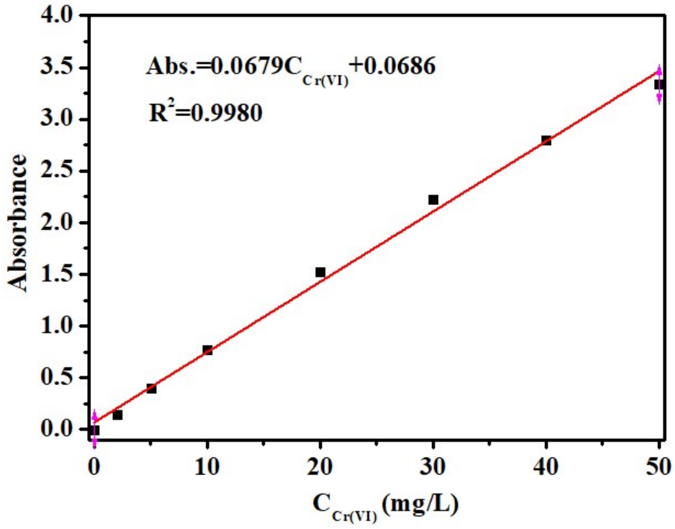

Fig. S1 Linear relationship between absorbance at 540 nm and concentration of Cr(VI).

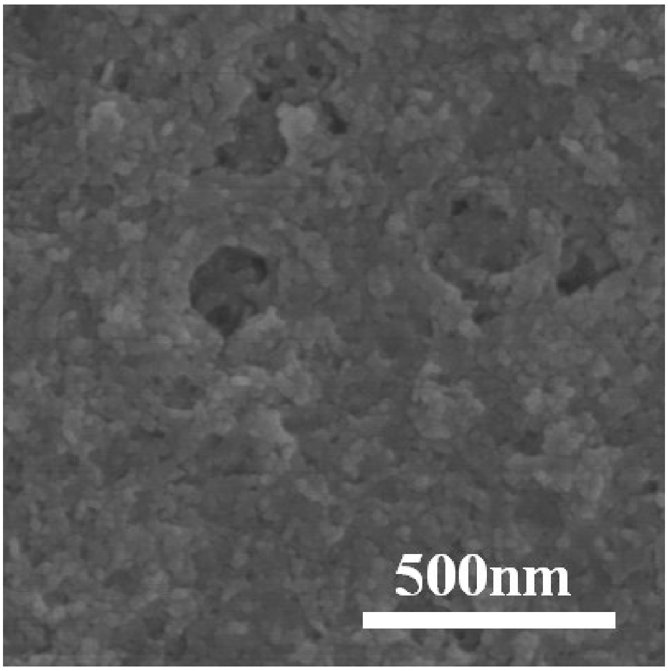

Fig.S2 FE-SEM images of the pure ZIS.

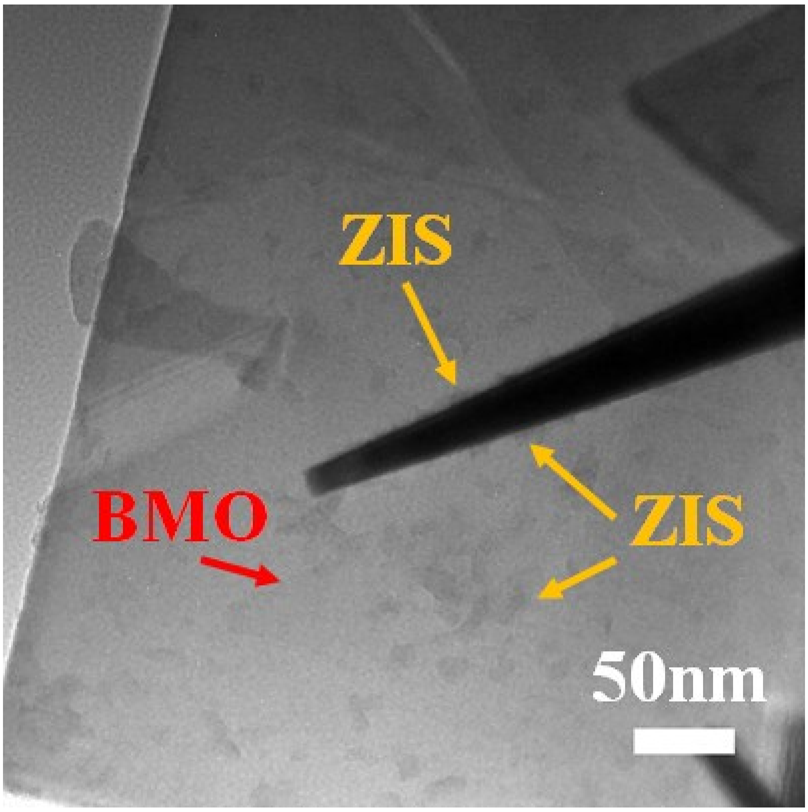

Fig. S3 TEM image of ZIS/BMO-0.6 sample.

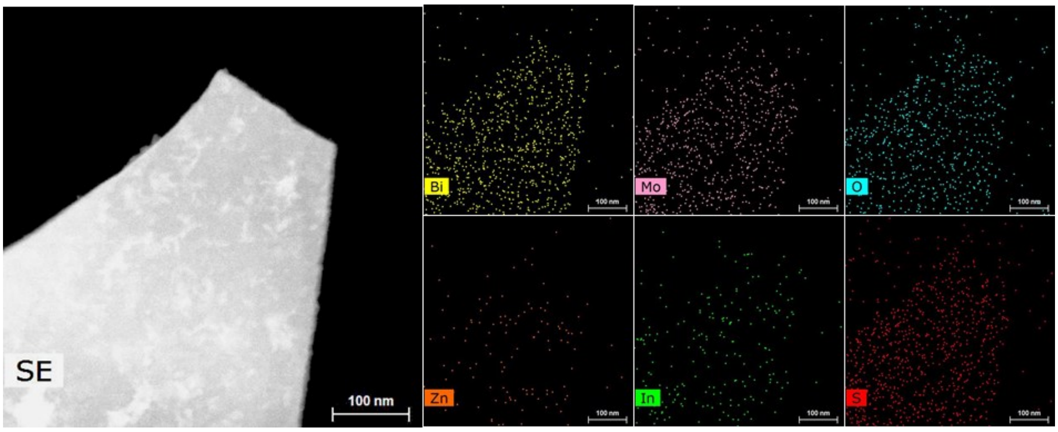

Fig. S4 EDX elemental mappings of the ZIS/BMO-0.6 sample.

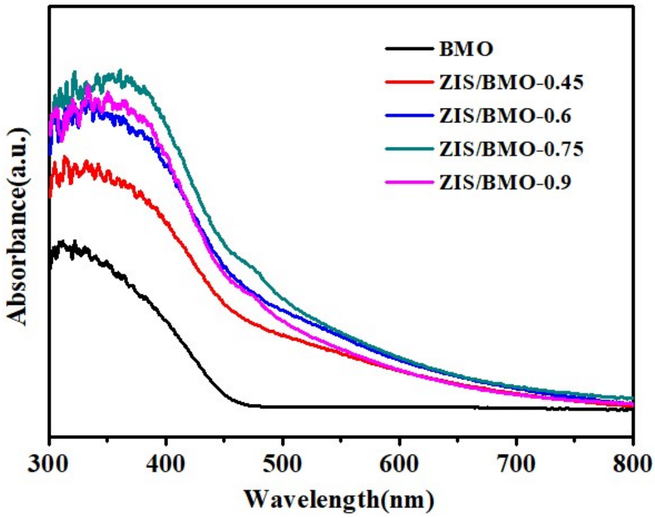

Fig. S5 UV-visible absorption spectra of pure BMO nanosheets, ZIS/BMO-0.45, ZIS/BMO-0.6, ZIS/BMO-0.75 and ZIS/BMO-0.9.

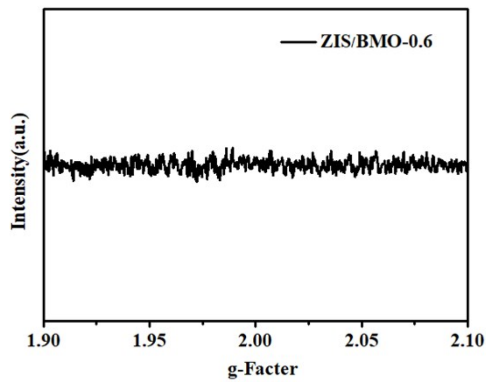

Fig. S6 EPR spectra of ZIS/BMO-0.6.

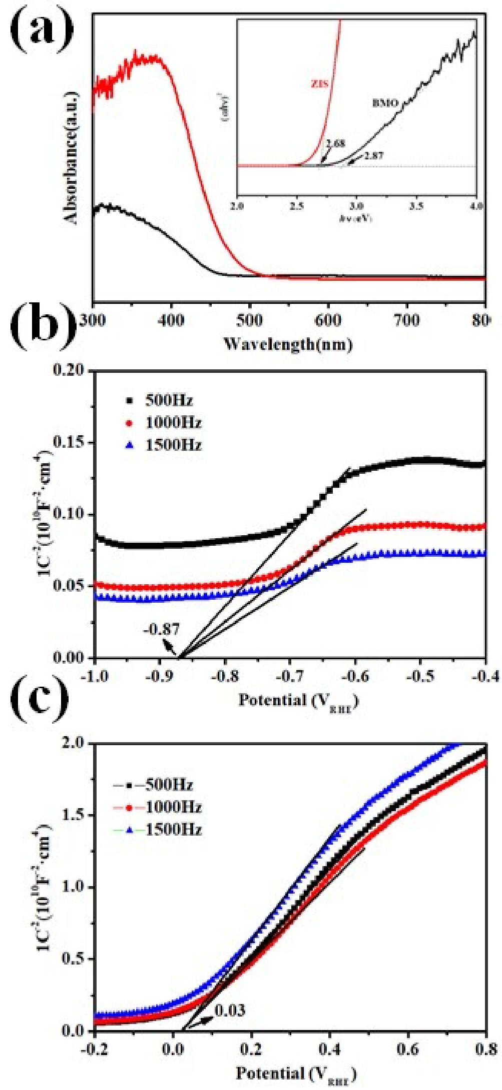

Fig. S7 (a) UV-visible absorption spectra of BMO nanosheets and ZIS nanoflakes (the inset shows the corresponding band edges), Mott-Schottky plots of (b) ZIS nanoflakes, and (c) BMO nanosheets.

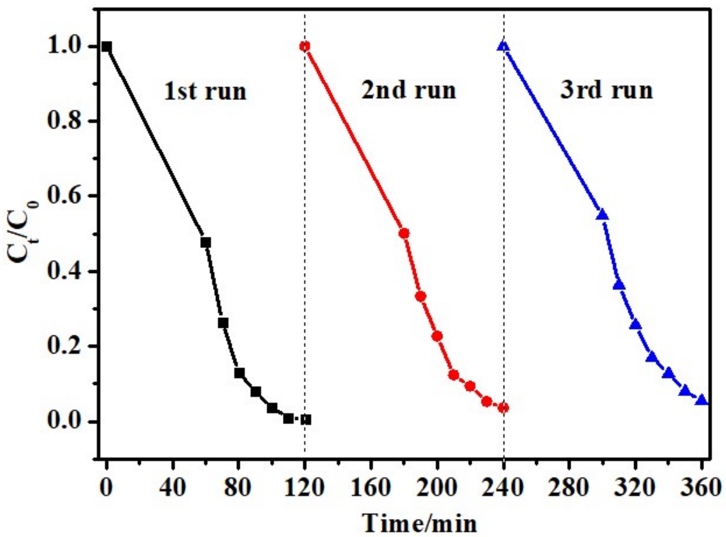

Fig. S8 Multiple cycles of the ZIS/BMO-0.6 sample in the the photocatalytic reduction of Cr(VI) under visible-light irradiation for 60 min.

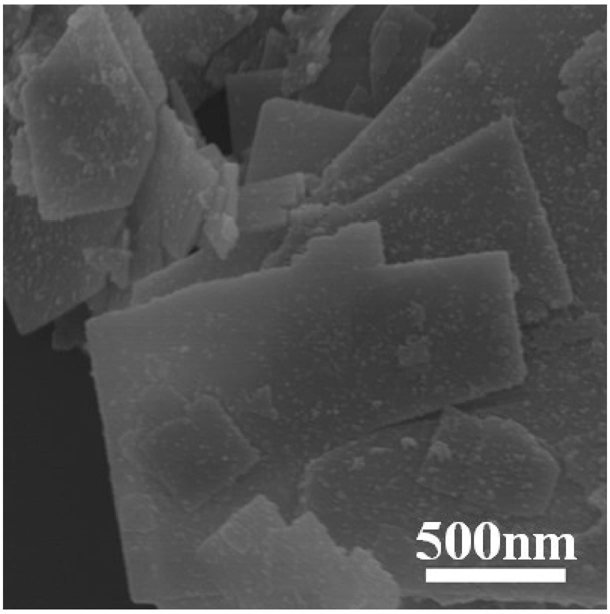

Fig. S9 The SEM image of the recovered ZIS/BMO-0.6 after the 3 cycle experiments for photocatalytic Cr(VI) reaction.

Table S1. Comparison of Cr(VI) photoreduction activity of pure BMO and ZIS/BMO-0.6 with the well-known catalysts reported in the recent literatures.

Photocatalyst	Catalyst Quality (mg)	Initial Cr(VI) concentration (mg/L)	Time(min)	Reduction rate (%)	Reference
Bi_2MoO_6 nanoflakes	50	25	60	28	This work
$ZnIn_2S_4/Bi_2MoO_6$	50	25	60	100	This work
Bi_2MoO_6 nanosheets	100	50	150	22.78	1
Bi_2MoO_6/ZnO	100	50	150	100	1
Bi_2MoO_6/Ti_3C_2 MXene	10	15	60	100	2
$BiVO_4/Bi_2S_3$	5	20	60	91.2	3
$BiVO_4/Bi_2S_3$	300	50	150	100	4
$PANI/SnS_2/NRG$	300	50	60	100	5
ZnO/Bi_2S_3	50	20	120	96	6
$Fe_2O_3/ZnFe_2O_4@Ti_3C_2$	20	10	90	85	7
$TiO_2/BiOCl$	100	15	180	90.2	8
$g\text{-}C_3N_4/Bi_2WO_6$	50	10	120	87.4	9
Bi_2S_3/Bi_2WO_6	20	10	60	95	10

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