Supporting Information

Facile Template Free Approach for the Large Scale Solid Phase Synthesis of Nanocrystalline XIn_2S4 (X=Cd/Zn) and it's Photocatalytic Performance for H_2 Evolution.

Sonali D. Naik, Sanjay K. Apte,[*a] Sunil N. Garaje, Yogesh A. Sethi, Manish D. Shinde, Sudhir A. Arbuj, Bharat B. Kale and Ravindra S. Sonawane[*b]

S1

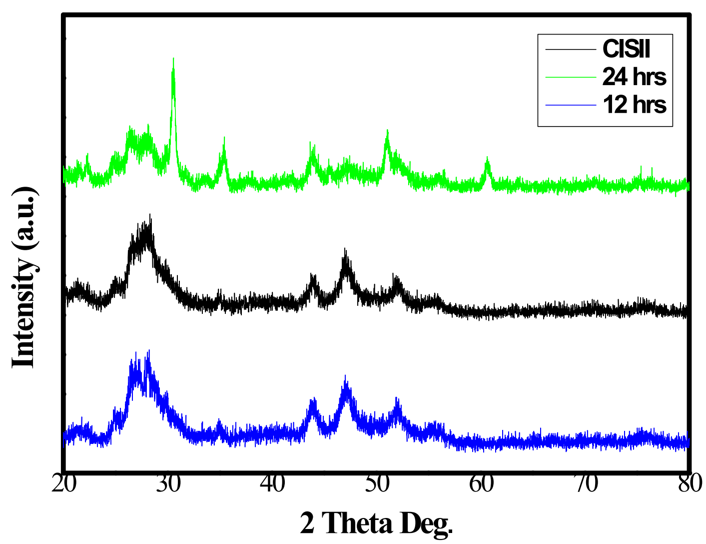

Figure 1: XRD of CIS-II, (a)12 and (b)24 hours duration sample

S2

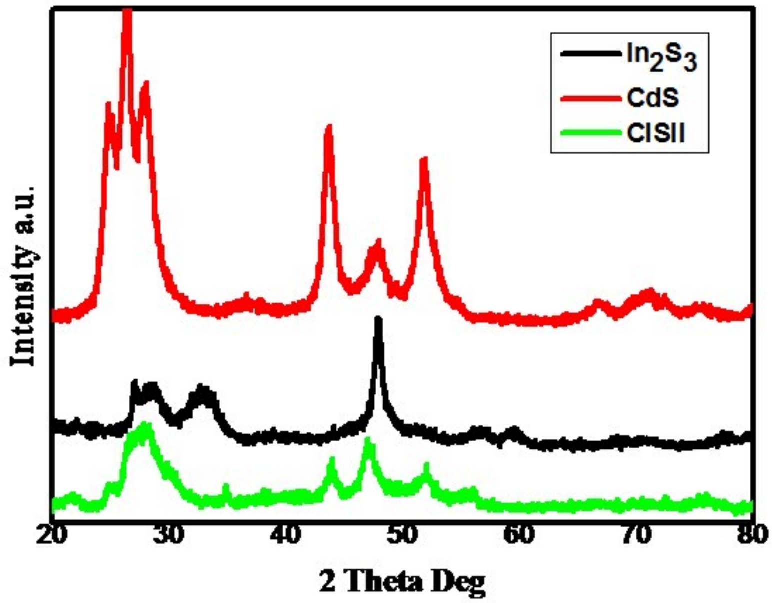

Fig.2 XRD pattern of Cds, In_2S_3 and CIS II

S3 EDAX Analysis:

The composition as verified by EDAX is in good agreement with theoretical values.

Element	Atomic % $CdIn_2S_4$	Atomic % $ZnIn_2S_4$
Cd	15.92	----
Zn	----	9.48
In	30.34	35.48
S	53.74	55.04

S4

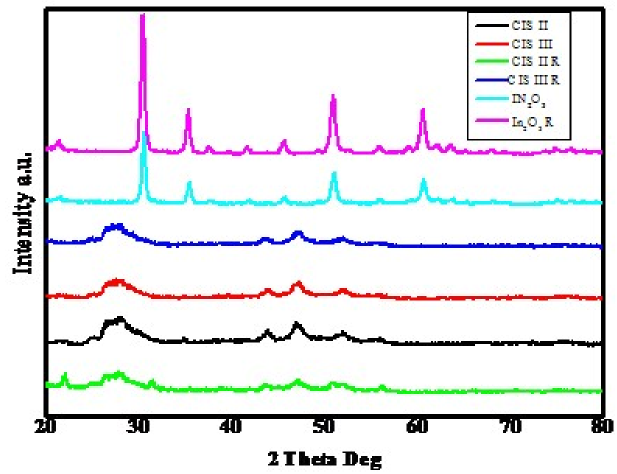

Fig. 4 XRD pattern of Reused Samples

S5: Comparison of rate of H_2 evolution from H_2S of nanostructured of previously reported $CdIn_2S_4$ and $ZnIn_2S_4$.

Photacatalyst	H_2 evolution rate	Reference
$CdIn_2S_4$	6476 μmol h^{-1} g^{-1}	35
$CdIn_2S_4$	6960 μmol h^{-1} g^{-1}	12
$ZnIn_2S_4$	8818 μmol h^{-1} g^{-1}	New Reference
$ZnIn_2S_4$	8748 μmol h^{-1} g^{-1}	14
$CdIn_2S_4$	6085 μmol h^{-1} g^{-1}	This Work
$ZnIn_2S_4$	6912 μmol h^{-1} g^{-1}	This Work

S6: Comparison of rate of H_2 evolution from H_2O by using similar photocatalyst reported previously.

Photacatalyst	**Sacrificial reagent system**	**H_2 evolution rate**	**Reference**
$CdS/CdIn_2S_4$	0.35 M Na_2S+ 0.25 M Na_2SO_3	823 µmol/h/g	1
$CdIn_2S_4$/ graphene	0.35 M Na_2S+ 0.25 M Na_2SO_3	713 µmol/h/g	2
$TiO_2/CdIn_2S_4$ nanoheterostructure	0.25 M Na_2S+ 0.35 M Na_2SO_3	7.86 mmol/h/g	3
$CdIn_2S_4$	0.25 M Na_2S+ 0.35 M Na_2SO_3	45.18 µmol/h	3
$ZnIn_2S_4$	TEOA	13.47 mmol/h/g	4
$ZnIn_2S_4$ (without Pt loading)	0.25 M Na2SO3/0.35 M Na2S	150 µmol/h/g	5
$CdIn_2S_4$	Methanol	28.57 µmol/h/g	This work
$CdIn_2S_4$	Benzyl Alcohol	33.92 µmol/h/g	This work
$ZnIn_2S_4$	Methanol	32.1 µmol/h/g	This work
$ZnIn_2S_4$	Benzyl Alcohol	60.75 µmol/h/g	This work

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