Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Hierarchical 3D $ZnIn_2S_4$/graphene nano-heterostructures: *in-situ* fabrication with duel mimics in solar hydrogen production and anode for Lithium ion battery.

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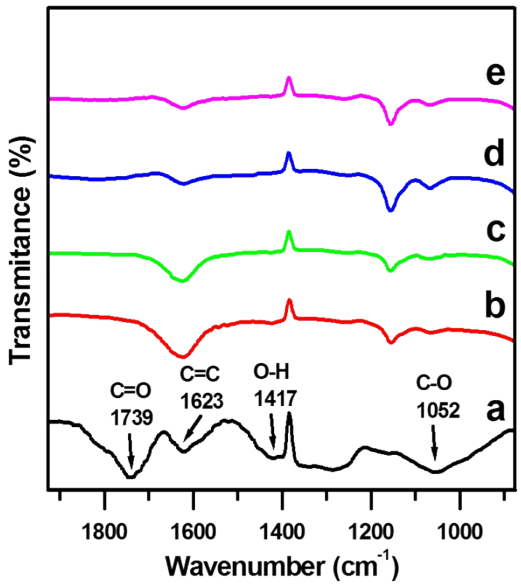

Figure S1. FTIR spectra of samples (a) GO and the all $ZnIn_2S_4$/Gr nano-heterostructures with different percent of GO loading synthesized at 150°C for 30h (b) 0.5% (GZIS1) (c) 1% (GZIS2) (d) 3% (GZIS3) and (e) 5% (GZIS4)

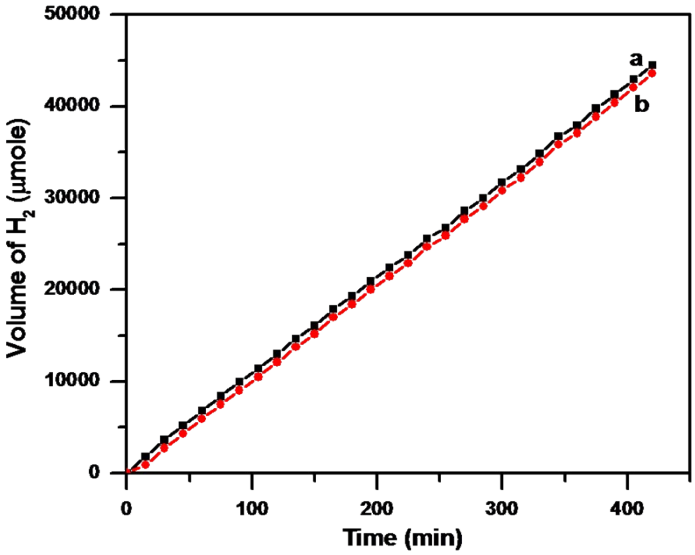

Figure S2. Time verses volume of H_2 (µmole) evolution of recycled sample GZIS2

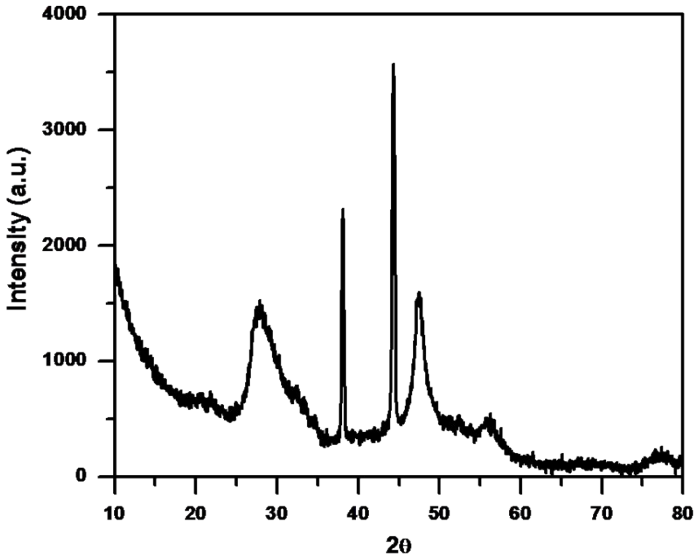

Figure S3. XRD spectrum of sample GZIS2 after three cyles of photocatalytic study

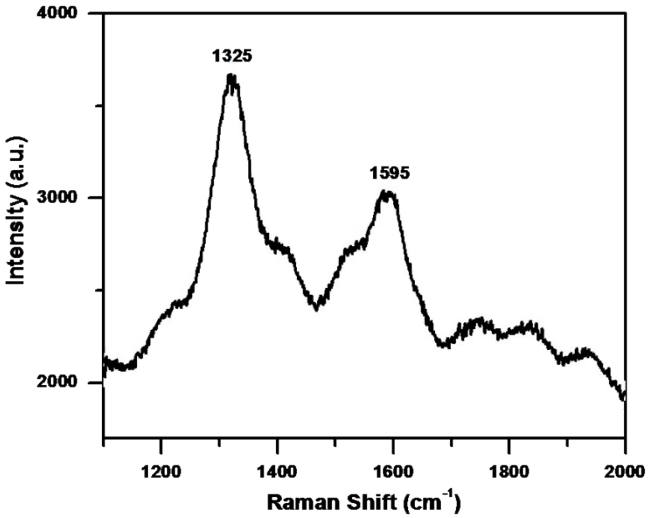

Figure S4. Raman spectrum of sample GZIS2 after three cyles of photocatalytic study

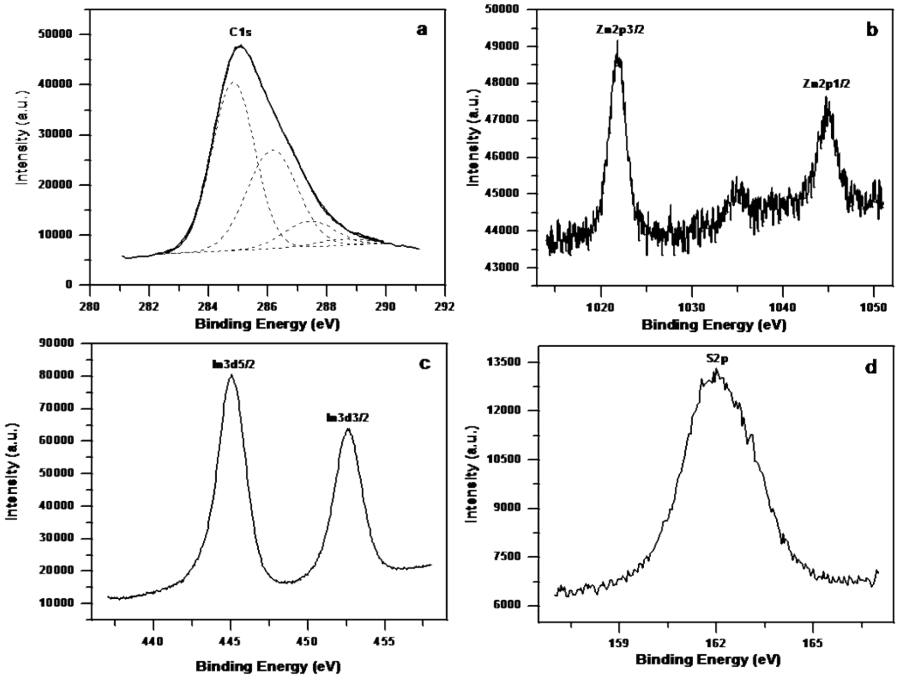

Figure S5. XPS patterns of of sample GZIS2 after three cyles of photocatalytic study

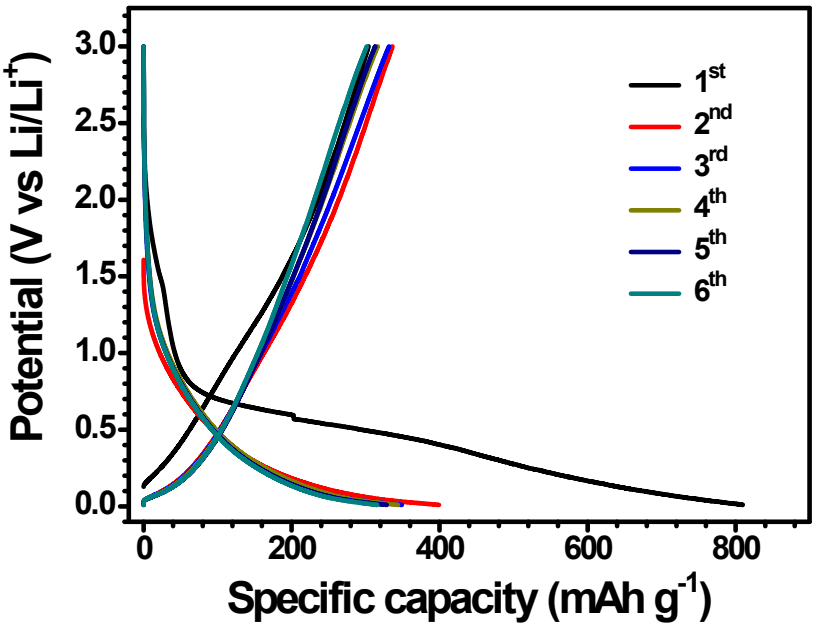

Figure S6. Charge –discharge profiles of pure graphene electrode.