Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Solar hydrogen evolution using $CuGaS_2$ photocathode improved by incorporating reduced graphene oxide

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Supporting information

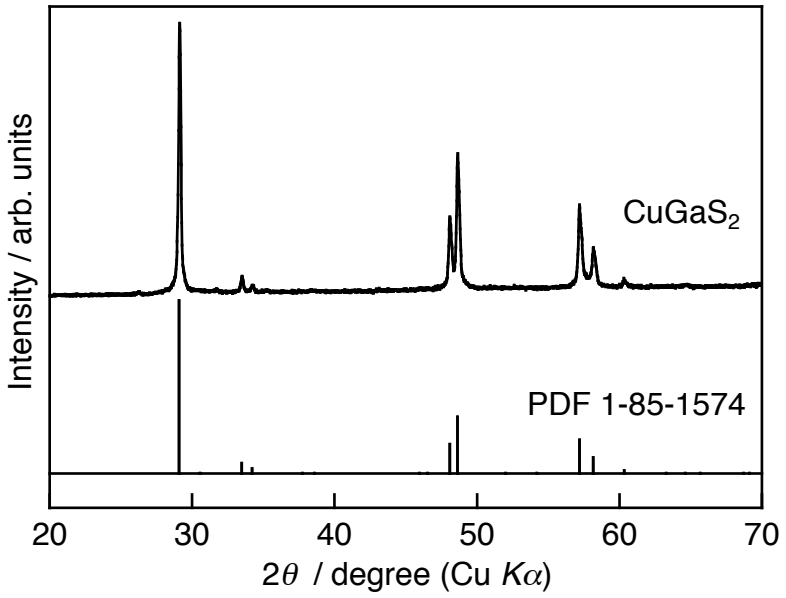

Figure S1 XRD pattern of $CuGaS_2$ synthesized by a solid-state reaction.

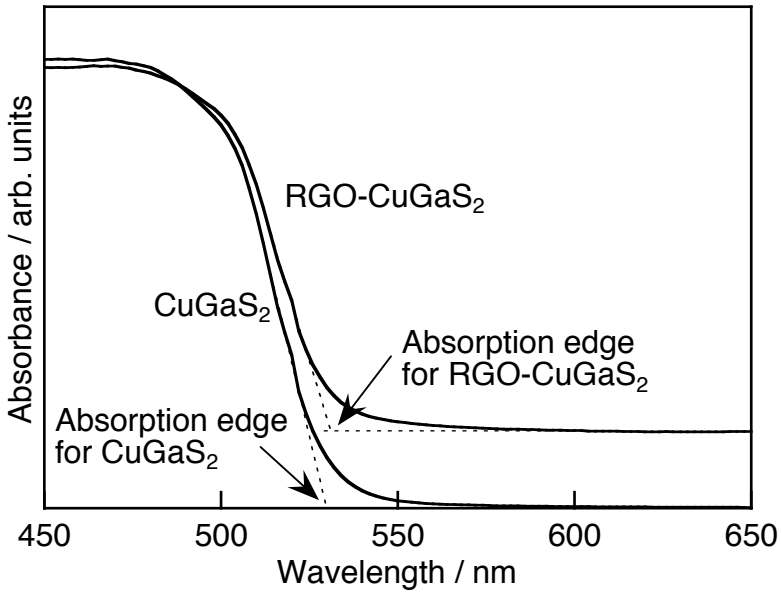

Figure S2 Diffuse reflectance spectra of $CuGaS_2$ and RGO-$CuGaS_2$.

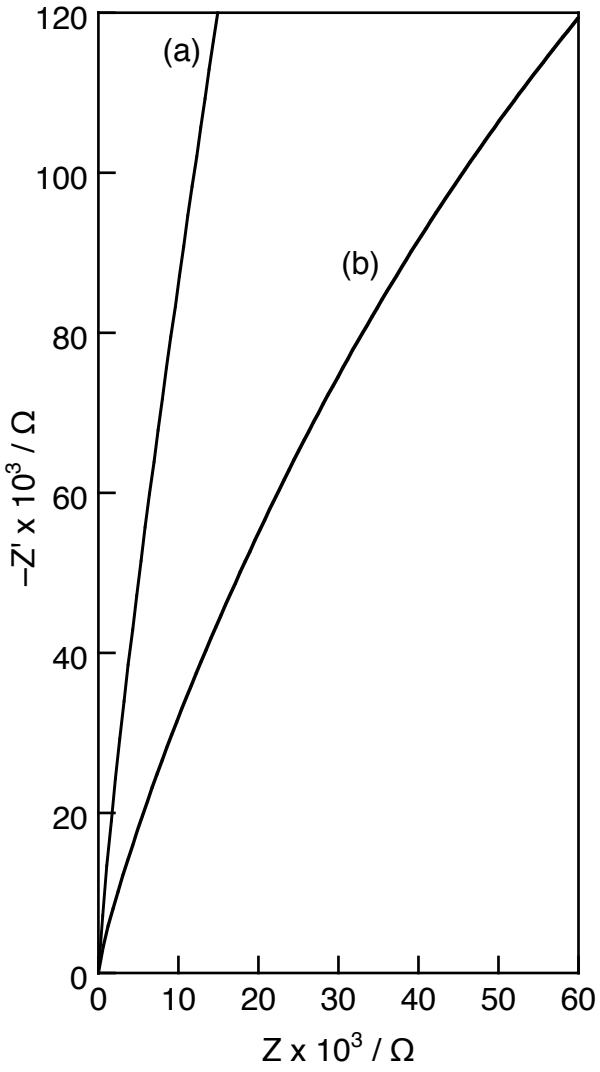

Figure S3 Electrochemical impedance spectra of (a) $CuGaS_2$ and (b) RGO-$CuGaS_2$ photoelectrodes.

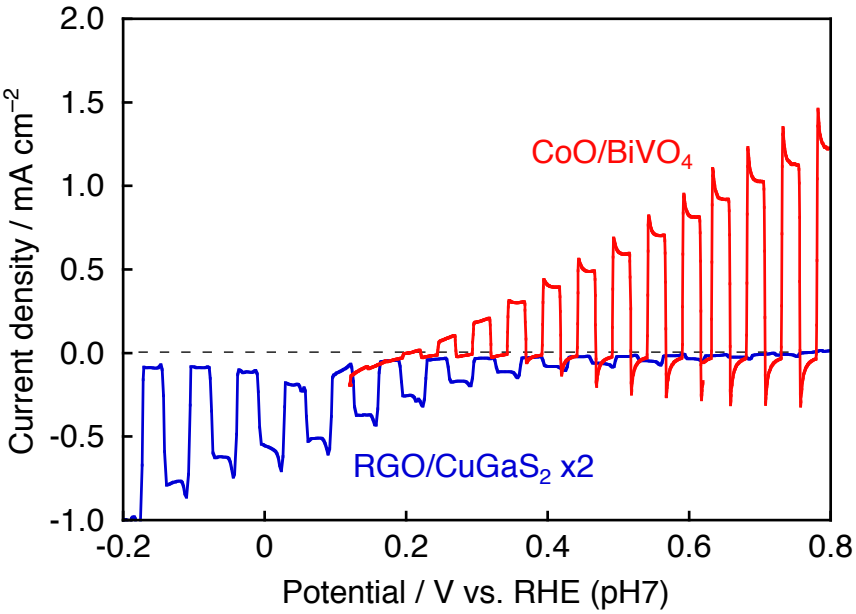

Figure S4 *I-V* curves of RGO-$CuGaS_2$ composite photocathode and CoOx-loaded $BiVO_4$ photoanode under visible light irradiation. Electrolyte: 0.1 mol L^{-1} K_2SO_4, light source; 300-W Xe lamp with a cutoff filter (λ>420 nm).

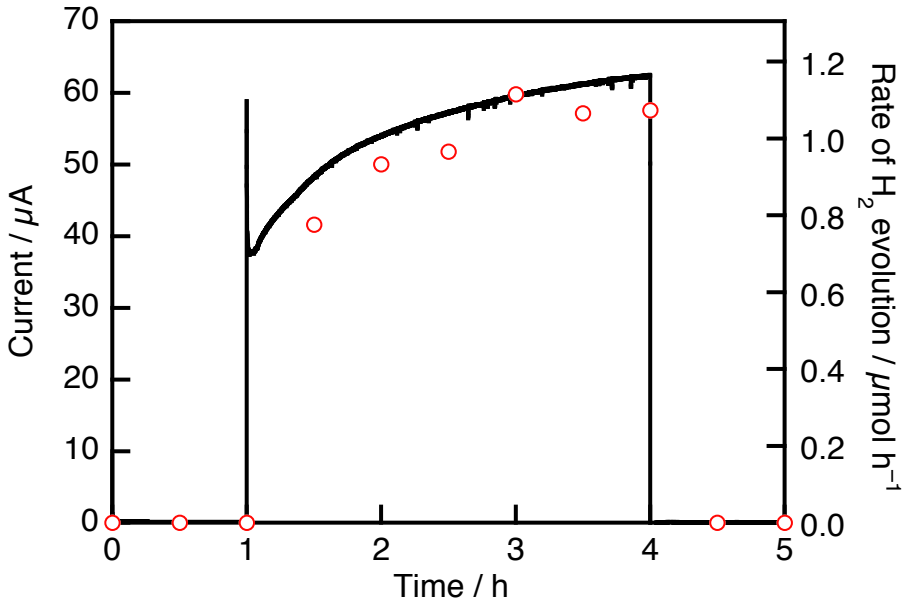

Figure S5 Current (left axis) and rate of H_2 evolution (right axis) using a photoelectrochemical cell consisting of RGO-$CuGaS_2$ composite photocathode (1.9 cm^2) and CoOx-loaded $BiVO_4$ photoanode (1.1 cm^2) with applying 0.5 V of bias between two electrodes. Electrolyte: aqueous buffer solution containing dissolved KH_2PO_4 and Na_2HPO_4 (pH7), light source: simulated sunlight (AM 1.5, 100 mW).