Supporting Information

Binary flux-promoted formation of trigonal $ZnIn_2S_4$ layered crystals using ZnS-containing industrial waste and their photocatalytic performance for H_2 production†

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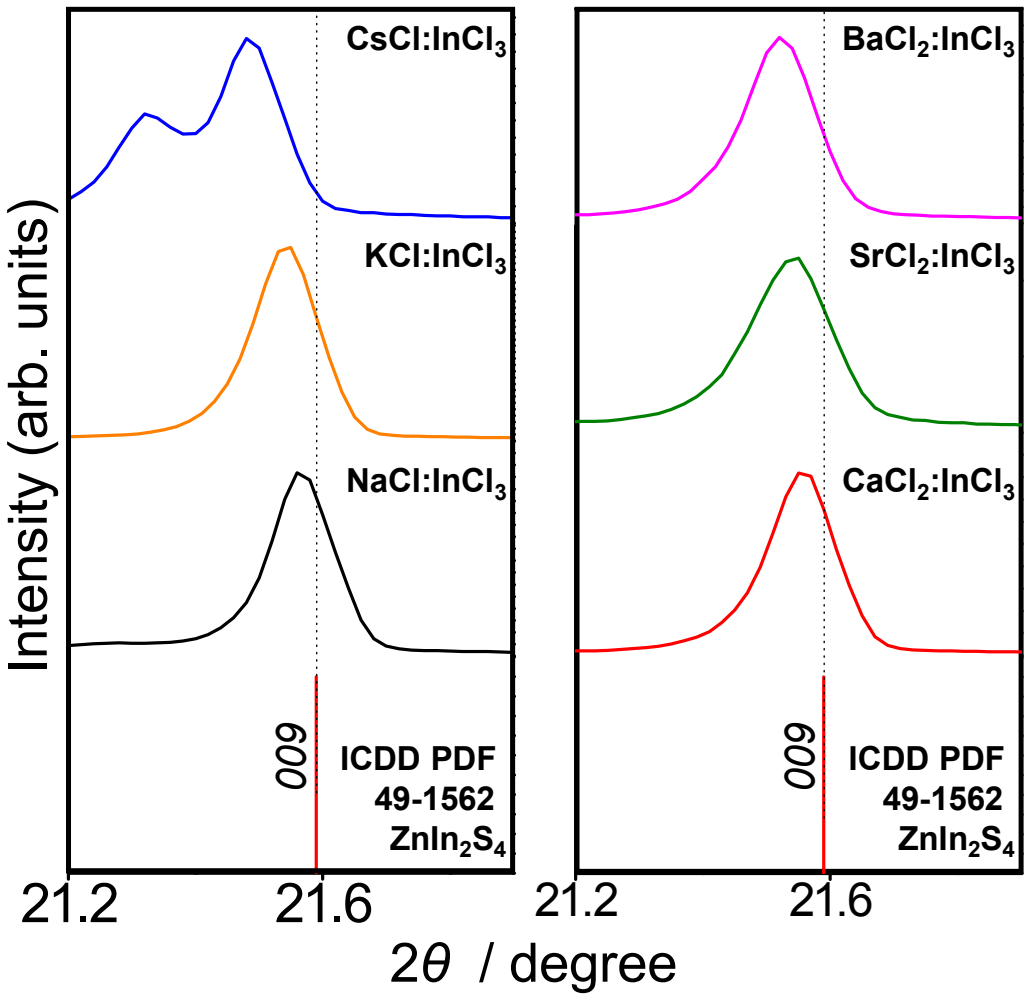

Figure S1. Enlarged XRD patterns of $ZnIn_2S_4$ crystals grown by a flux method at 800°C for 1 h under N_2 atmosphere with a 40 mol% solute concentration using different fluxes: NaCl:$InCl_3$, KCl:$InCl_3$, CsCl:$InCl_3$, $CaCl_2$:$InCl_3$, $SrCl_2$:$InCl_3$, and $BaCl_2$:$InCl_3$.

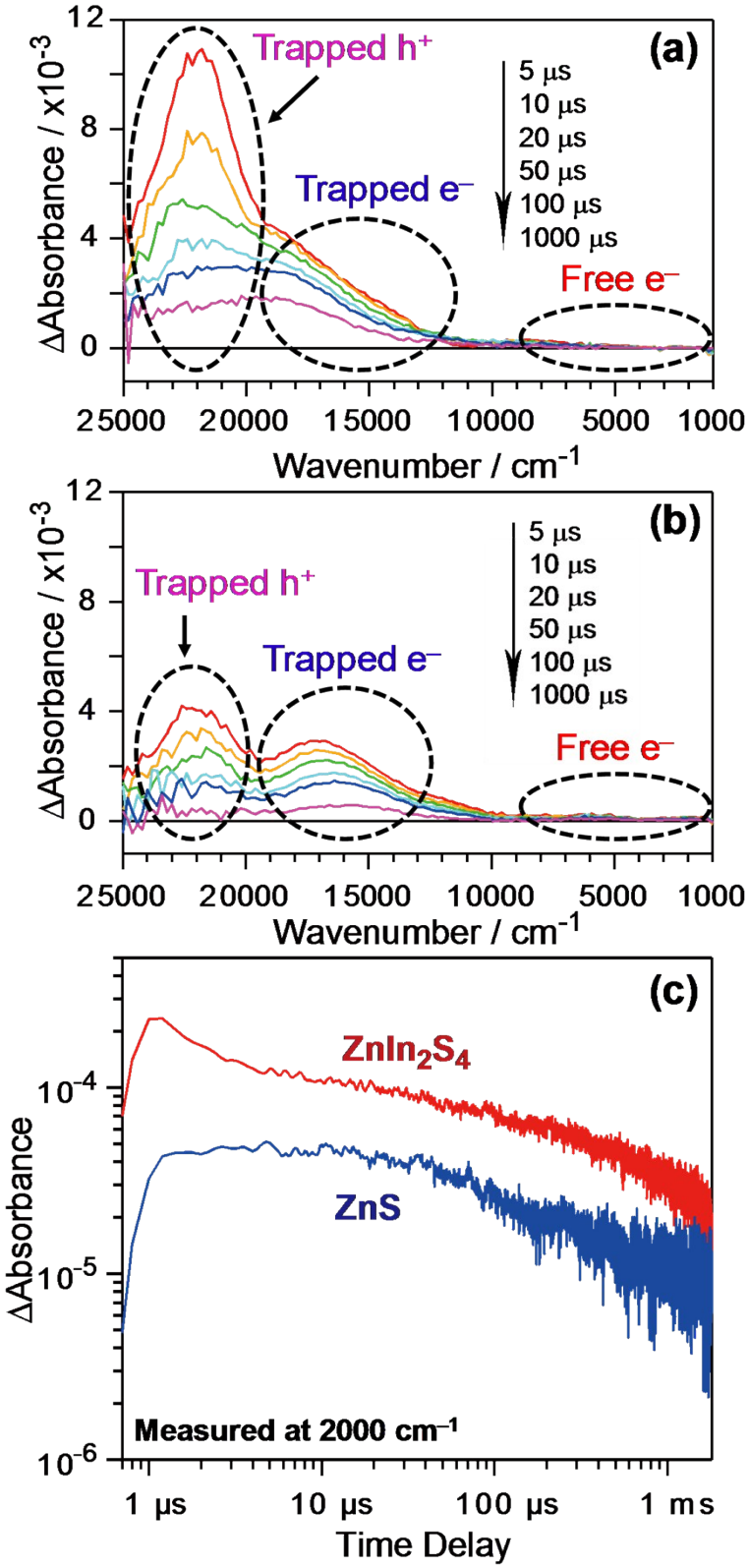

Figure S2. Transient absorption spectra of (a) ZnS and (b) $ZnIn_2S_4$ crystals grown by a flux method using KCl:$InCl_3$ flux excited by UV laser pulses (355 nm, 6-ns duration, 0.5 mJ per pulse, and 5 Hz) in nitrogen atmosphere. (c) Decay kinetics of photogenerated free electrons (2,000 cm^{-1}) in ZnS and $ZnIn_2S_4$ crystals grown by a flux method using KCl:$InCl_3$ flux excited by UV laser pulses.

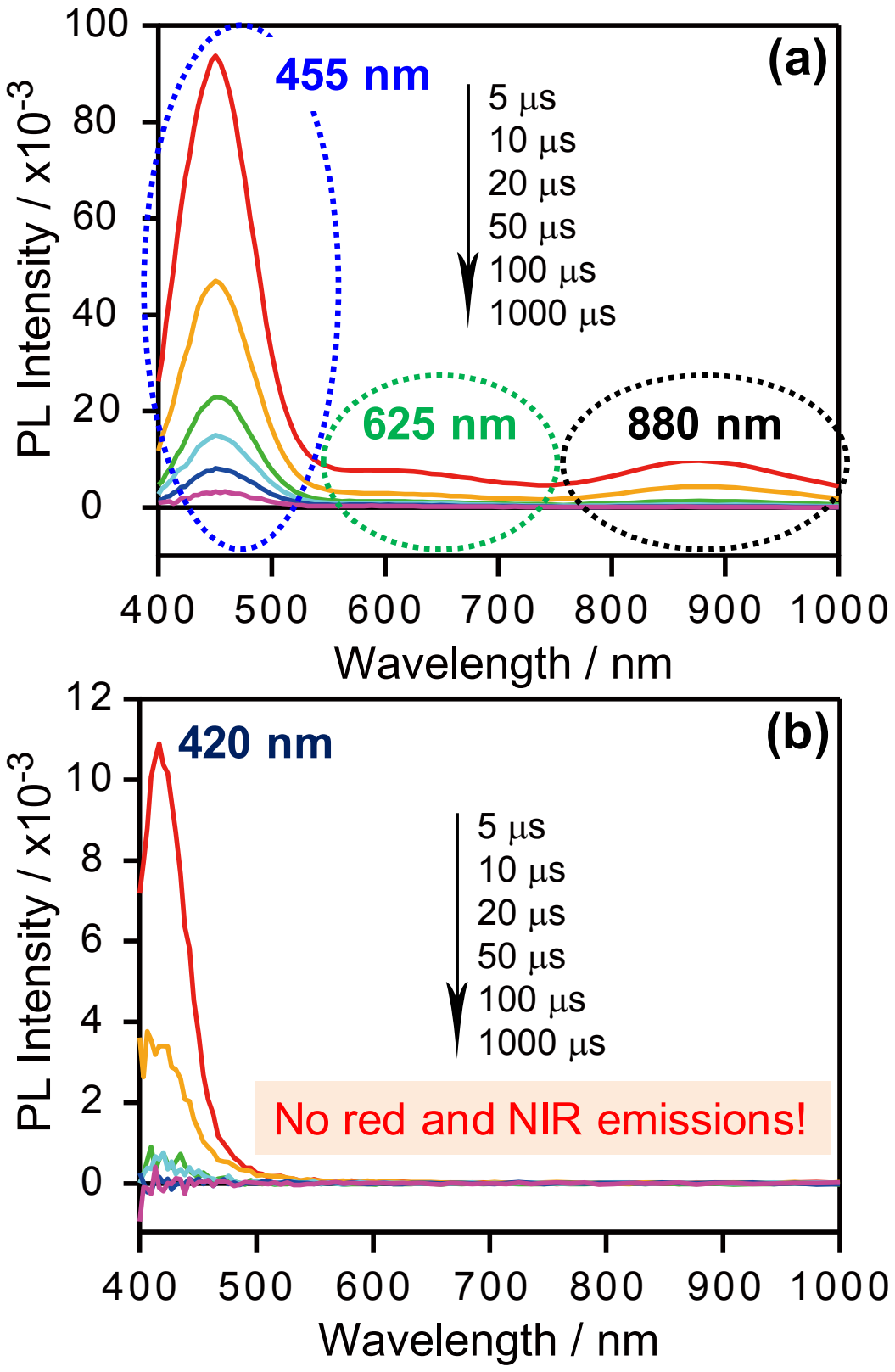

Figure S3. PL spectra of (a) ZnS and (b) $ZnIn_2S_4$ crystals grown by a flux method using KCl:$InCl_3$ flux.