Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Hot Electron Transfer in Zn-Ag-In-Te Nanocrystal-Methyl Viologen Complexes Enhanced with Higher-Energy Photon Excitation

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1. Experimental

Preparation of Zn-Ag-In-Te (ZAITe) NC-MV^{2+} complexes

ZAITe NC−MV^{2+} complexes were prepared according to a previous report on CdSe NC-MV^{2+} complexes with slight modification.[1,2] ZAITe NCs ($(AgIn)_xZn_{2(1-x)}Te_2$) in octane solution were synthesized with an x value of 0.75 by the reported method.[3] The original solution of ZAITe NCs (0.20 cm^3) was diluted ten times with octane, and then 10 mm^3 MV^{2+} (1.0 mmol dm^{-3}) of ethanol solution was added to the solution with vigorous stirring. After ethanol had been removed by evaporation, the solution was diluted to 5.0 cm^3 with octane. The sample of thus-prepared ZAITe NC-MV^{2+} complexes was used for measurement.

2. Results

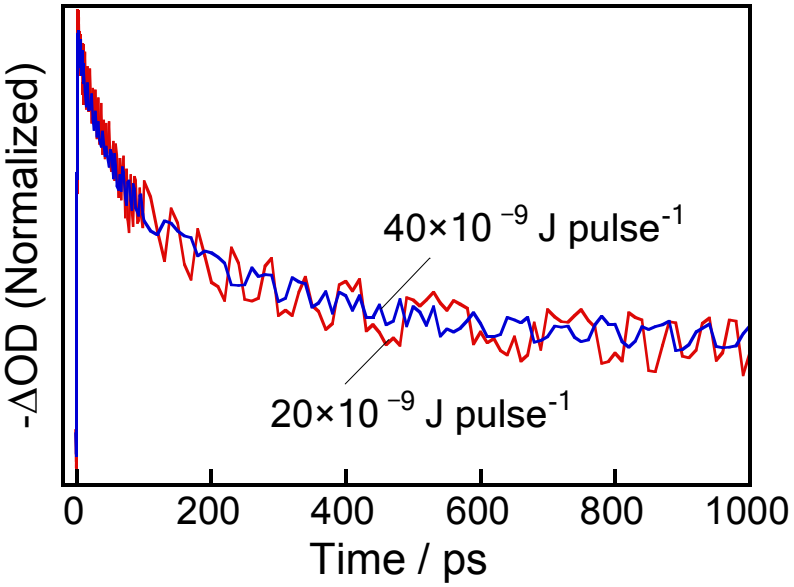

Figure S1. Comparison of TA dynamics of ZAITe NCs at 1.29 eV photoexcited by 1.55-eV photons with different excitation intensities.

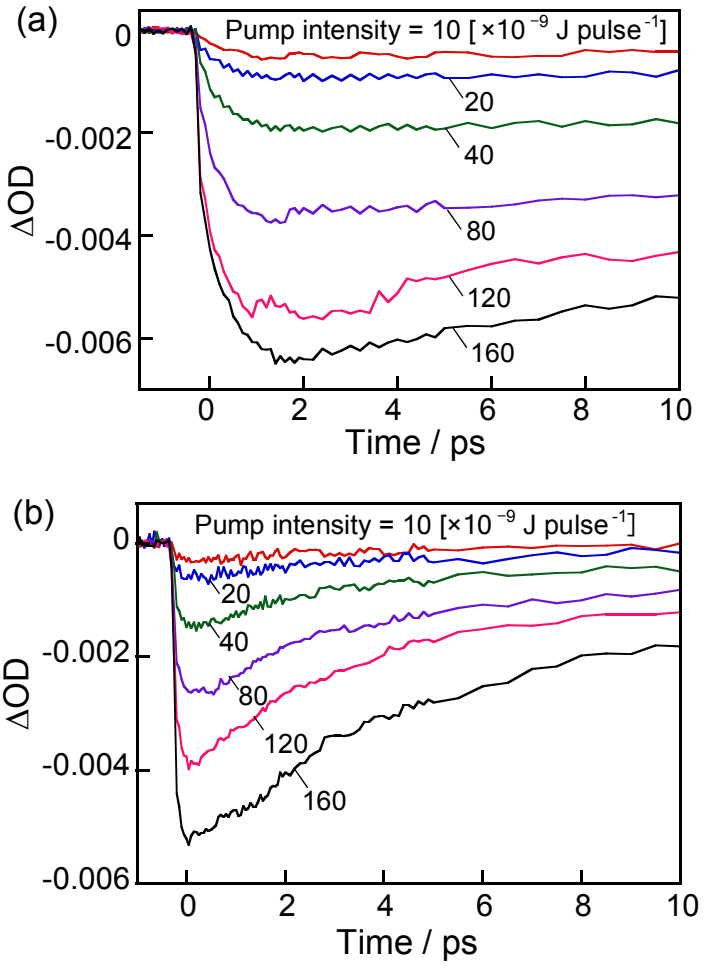

Figure S2. TA recovery dynamics of ZAITe NCs at 1.29 eV excited by irradiation of 1.55-eV photons with different pump intensities. The samples were ZAITe NCs (a) and ZAITe NC-MV^{2+} complexes (b). Profiles for the fast component time region of less than 10 ps are shown.

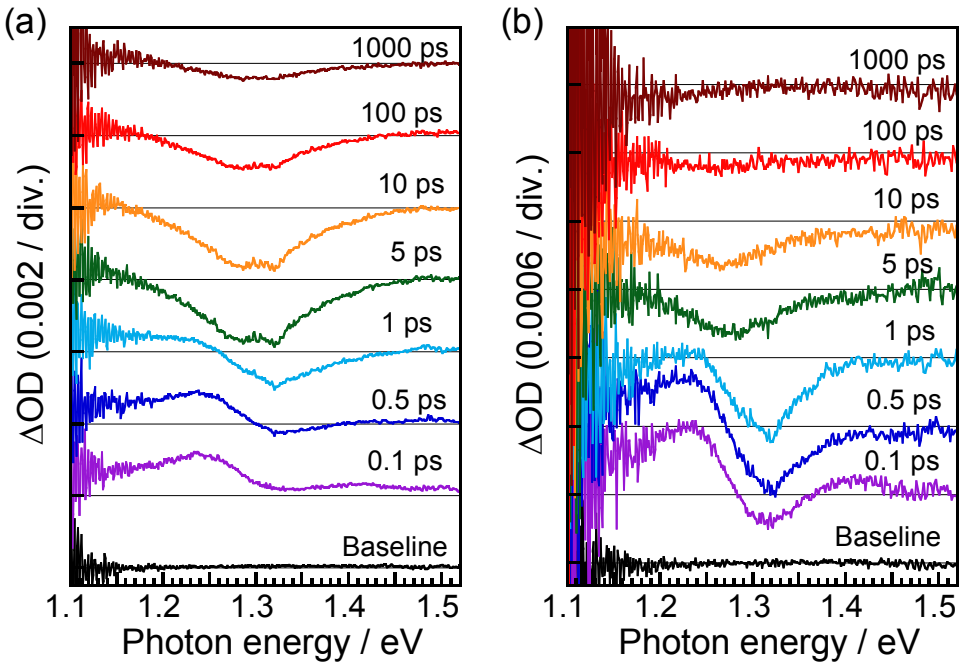

Figure S3. Transient absorption spectra of ZAITe NCs (a) and ZAITe NC-MV^{2+} complexes (b) excited by irradiation of 3.1-eV photons with pump intensity of 20×10^{-9} J $pulse^{-1}$.

Table S1. Multi-exponential fitting results for evolution and decay profiles of the bleaching signal at 1.29 eV in TA spectra (Fig. 2c and d).

Excitation energy / eV	**Sample**	**hν/E_g**	**τ_{rise} / ps**	**τ_1 / ps (A_1/%)**	**τ_2 / ps (A_2/%)**	**τ_3 / ns (A_3/%)**
1.55	ZAITe NCs	1.22	0.45	36 (31%)	210 (41%)	6.1 (28%)
	ZAITe NC-MV^{2+} complexes		0.22	2.7 (67%)	43 (33%)	

The TA decay profile can be fitted with the form, $\Delta OD(t) \propto \sum_i A_i \exp(-\frac{t}{\tau_i})$, where τ_i represent the lifetimes and A_i are the corresponding amplitudes.[4] The measured decay parameters along with the rise-time (τ_{rise}) are also presented. For obtaining the best-fit curve, tri- and bi-exponential functions were applied for ZAITe NCs and ZAITe NC-MV^{2+} complexes, respectively.

3. References

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