

Supporting information

Rod-shaped Zn-Ag-In-Te Nanocrystals with Wavelength-Tunable Band-Edge Photoluminescence in the Near-IR Region

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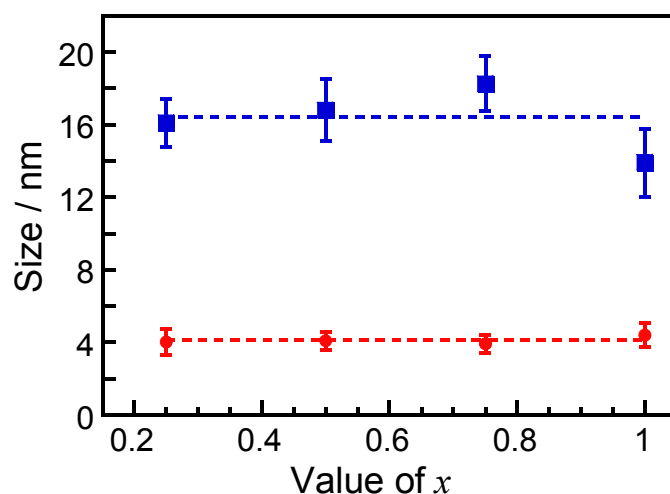


Fig. S1 Dependence of width (circles) and length (squares) of ZAlTe NCs on the value of x in the preparation. Error bars represent the size distribution.

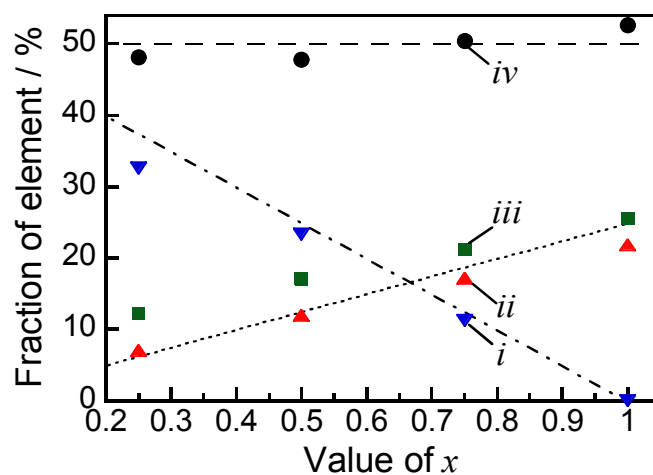


Fig. S2 Chemical composition of ZAlTe NCs as a function of the value of x in the preparation. The elements in the particles are Zn (*i*), Ag (*ii*), In (*iii*), and Te (*iv*). Lines show the stoichiometric fractions of Ag and In elements (dotted lines) and those of Zn (chained line) and Te (dashed line).

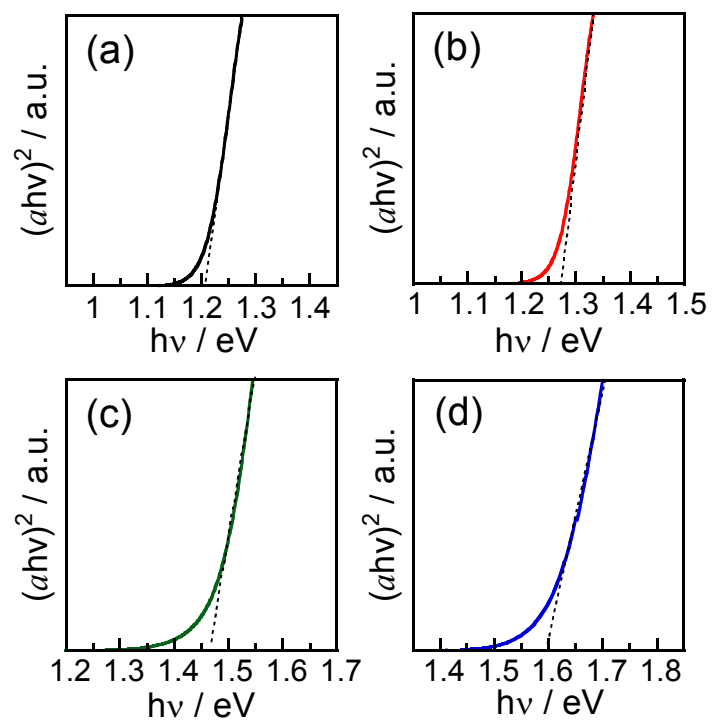


Fig. S3 Tauc plots of ZAlTe NCs prepared with x values of 1.0 (a), 0.75 (b), 0.5 (c), and 0.25 (d).

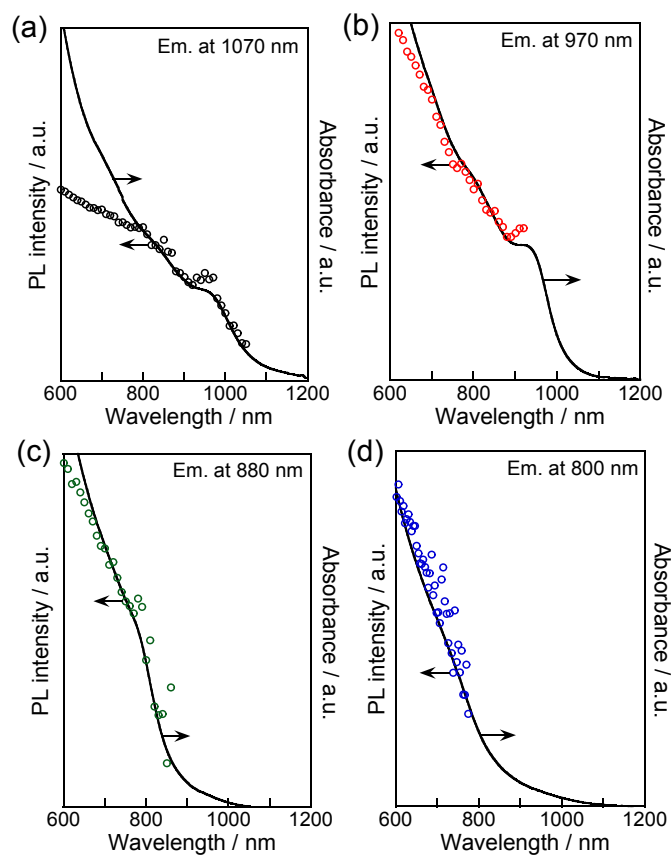


Fig. S4 Photoluminescence excitation (open circles) and absorption (solid lines) spectra of ZAlTe NCs prepared with x values of 1.0 (a), 0.75 (b), 0.5 (c), and 0.25 (d). The emission wavelength monitored is indicated in each panel.

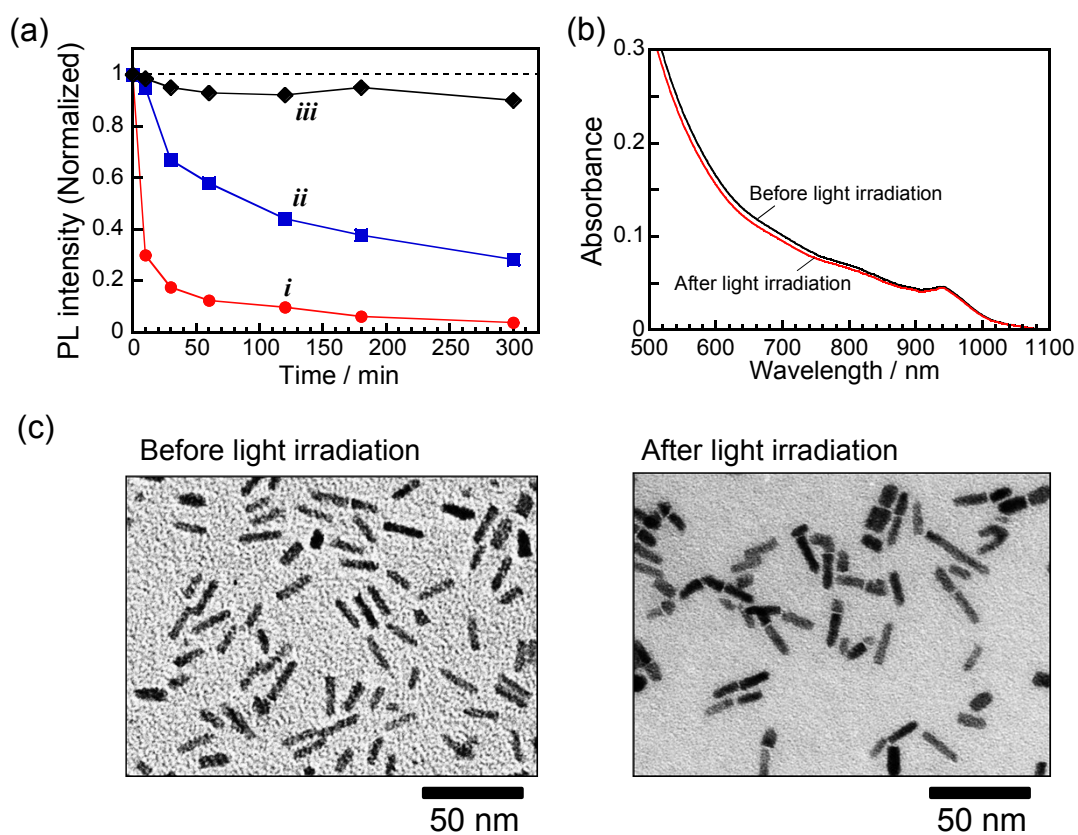


Fig. S5 (a) Changes in PL intensities of octane solutions containing ZAITe NCs with $x = 0.75$ at room temperature with various conditions. Each PL intensity, normalized by the corresponding initial value, was monitored at the peak wavelength of 974 nm. The PL stability tests of ZAITe NC solutions were carried out (i) with monochromatic light irradiation at 700 nm in air (the intensity of 8.4 mW cm^{-2}), (ii) in the dark in air, and (iii) in the dark under an N_2 atmosphere. (b) Absorption spectra and (c) TEM images of ZAITe NCs ($x = 0.75$) uniformly dispersed in octane before and after light irradiation at 700 nm in air for 300 min.

Table S1 Multi-exponential fitting results for decay profiles of band-edge photoluminescence of ZAlTe NCs.

| ZAlTe NCs | Detection wavelength of PL / nm | τ_1 / ns (A_1 / %) | τ_2 / ns (A_2 / %) | τ_3 / ns (A_3 / %) | τ_4 / ns (A_4 / %) | τ_{ave} / ns |
|------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------|
| $x = 1.0$ | 1030 | 48 (36.7) | 149 (63.3) | | | 133 |
| $x = 0.75$ | 970 | 4.0 (22.7) | 29 (43.6) | 89 (33.7) | | 70 |
| $x = 0.5$ | 900 | 2.2 (35.6) | 20 (35.5) | 101 (28.9) | | 83 |
| $x = 0.25$ | 820 | 0.50 (47.1) | 3.1 (34.0) | 16 (15.0) | 87 (3.9) | 48 |