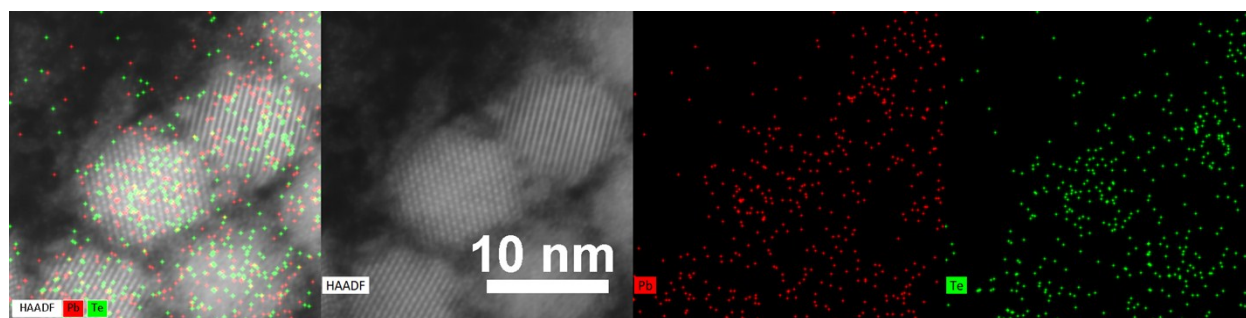


Supporting information (SI) for

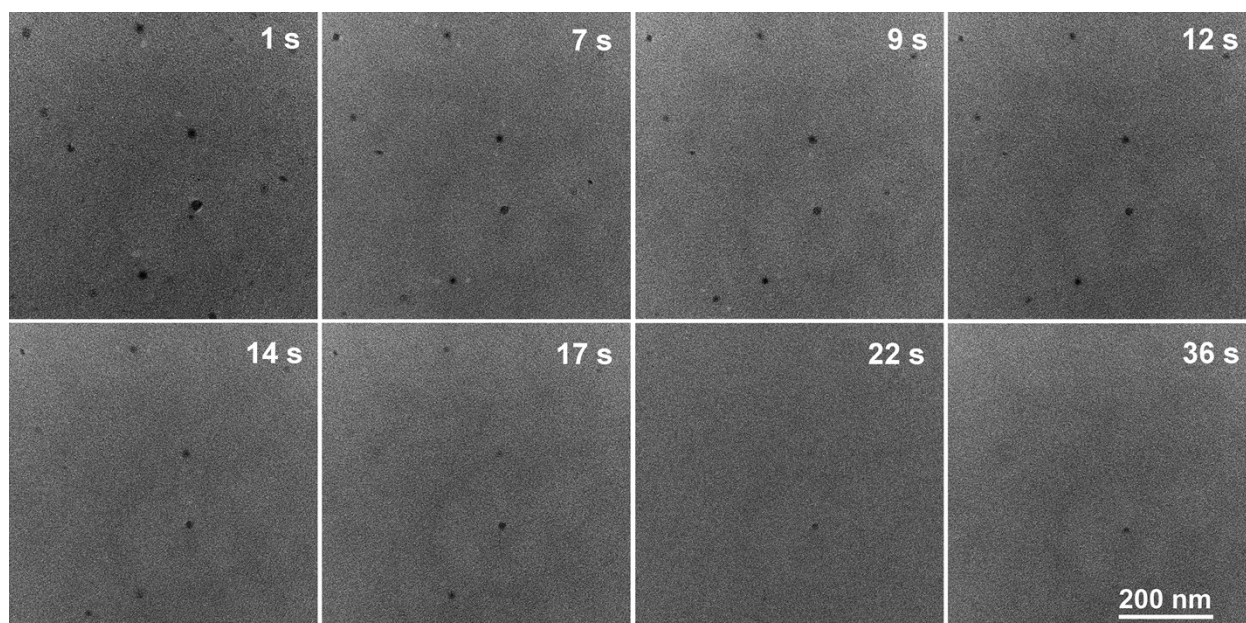
Controlling Dissolution of PbTe Nanoparticles in Organic Solvents during Liquid Cell Transmission Electron Microscopy

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**Figure S1.** Scanning transmission electron microscopy (STEM) with high-angle-annular dark field (HAADF) and energy dispersive spectroscopy (EDS) showing PbTe nanoparticle size, shape, and composition



**Figure S2.** Bright field TEM images of PbTe nanoparticles in toluene saturated with water ( $\sim 0.027$  M water in toluene) with high-water content with an electron dose rate of  $50 \text{ e}^-/\text{\AA}^2/\text{s}$  (low dose rate) during LCTEM. Total elapsed time of exposure to beam is shown on each frame.

**Video 1.** Bright Field Transmission Electron Microscopy (BF TEM) movies of dissolution of PbTe NPs in toluene as seen under electron dose rate of  $200 \text{ e}^-/\text{\AA}^2/\text{sec}$  (high dose rate) during in situ liquid cell TEM (LCTEM) experiment (explanation is presented on Fig. 2 on main text). The total time per frame is 1 sec.

**Video 2.** BF TEM movies of dissolution of PbTe NPs as seen for medium electron dose rate of  $100 \text{ e}^-/\text{\AA}^2/\text{sec}$  during in situ LC TEM experiment in toluene(explanation is presented on Fig. 3 on main text). The total time per frame is 1 sec.

**Video 3.** BF TEM movies of dynamics of PbTe NPs as seen under electron dose rate of  $50 \text{ e}^-/\text{\AA}^2/\text{sec}$  (low dose rate) during in situ LCTEM experiment in toluene (explanation is presented on Fig.4 on main text). No dissolution is observed even for exposure of electron beams for 5 minutes. The total time per frame is 1 sec.

**Video 4.** BF TEM movies of dynamics of PbTe NPs used for Fig. 6 in manuscript, with an electron dose rate of  $> 200 \text{ e}^-/\text{\AA}^2/\text{sec}$  during in situ LC TEM experiment at higher magnification than Videos 1-3. Very fast acquisition is used and total time per frame is 10 msec. At intermediate times, the particles fuse and lattice planes are visible while no features present after dissolution. The particles dissolve completely within 10 seconds with a consistently linear dissolution rate down to their detectable size limit ( $\sim 2 \text{ nm}$ ).