Supporting Information

Enhancing the Performance of Tin-Based Perovskite Solar Cells through Solvent Purification of Tin Iodide

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Figure S1. (a) Preparation process of commercial (the control one) SnI₂-based perovskite films.

Figure S2. XRD patterns of control, oxidized, and toluene-washed SnI₂.
Figure S3. Photography of (a) an oxidized SnI$_2$-fabricated perovskite film and (b) a toluene-washed SnI$_2$-fabricated perovskite film.

Figure S4. AFM images of (a) control SnI$_2$, (b) oxidized SnI$_2$, (c) and toluene-washed SnI$_2$-fabricated perovskite films.
**Figure S5.** Plots of derivative of EQE spectra used to determine bandgaps of (a) control, (b) oxidized, and (c) washed SnI₂-based perovskite films.

**Figure S6.** A cross-sectional SEM image of a representative FASnI₃ solar cell fabricated from toluene-washed SnI₂.
Figure S7. Photovoltaic parameters of the solar cells using toluene-washed SnI$_2$ with air oxidation for one day, three days, one week, and two weeks.

Figure S8. Long-term shelf storage stability of control, oxidized, and toluene-washed SnI$_2$-fabricated PSCs without encapsulation, which were stored in an N$_2$-filled glovebox at room temperature in the dark.
Figure S9. Light intensity-depended $V_{OC}$ of the solar cells employing (a) control, (b) oxidized, and (c) toluene-washed SnI$_2$. 