Supporting Information

Hierarchical Self-assembly of Hexagonal Single-Crystal Nanosheets into 3D Layered Superlattices with High Conductivity

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Figures

**Fig. S1.** HRTEM image of the 13-day aged nanorods prepared in cyclohexane.

**Fig. S2.** TEM image with SAED pattern of 3-month aged hexagonal nanosheets.
**Fig. S3.** HRTEM image of 3-month aged hexagonal nanosheets.

**Fig. S4.** XRD pattern of 3-month aged hexagonal nanosheets.

**Fig. S5.** (a,b) Microscope photograph and SEM image of 5-month aged layered crystals with superlattice structure in cyclohexane. (c,d) SEM images of 5-month aged layered crystals with superlattice structure in hexane and octane.
**Fig. S6.** EDS spectrum of 5-month aged layered crystals with superlattice structure in cyclohexane.

**Fig. S7.** SEM images of PANI after nanofibers are aged in (a) hexane; (b) octane; (c) benzene; (d) ethanol for 13 days, respectively.

**Fig. S8.** TEM with HRTEM images of the 13-day aged nanorods prepared in (a) hexane and (b) octane, respectively.
**Fig. S9.** (a-e) STM images and corresponding height profile of the 5-month aged PANI crystals with superlattice structure in (a) clyclohexane; (b) hexane; (c) octane; (d) benzene; (e) ethanol, respectively.