Supporting Data

All-Inorganic Perovskite $CsPb(Br/I)_3$ nanorods for Optoelectronic Application

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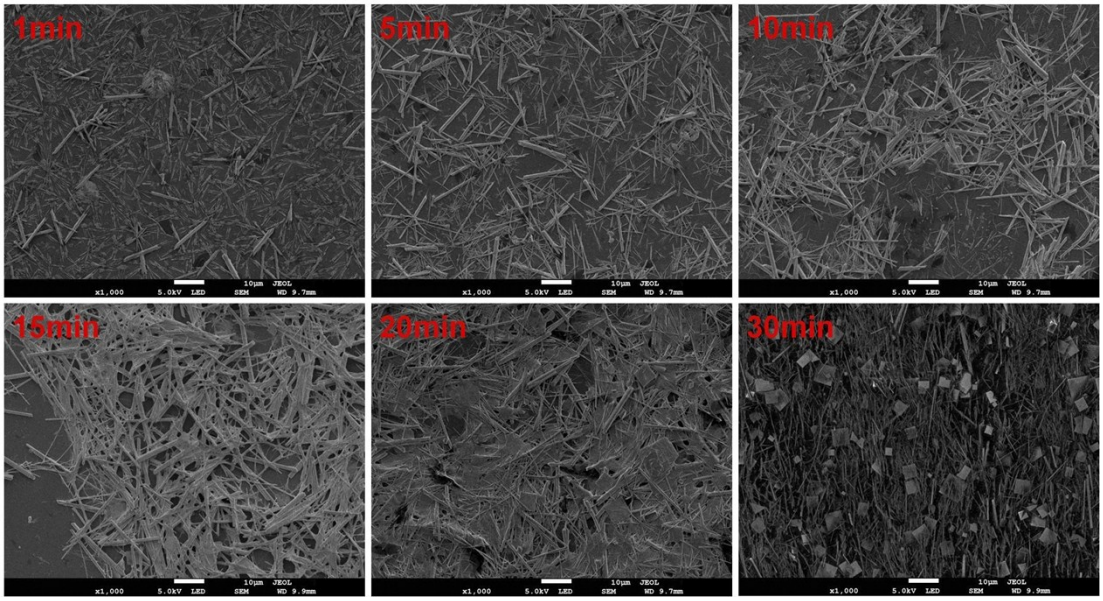
Experimental details:

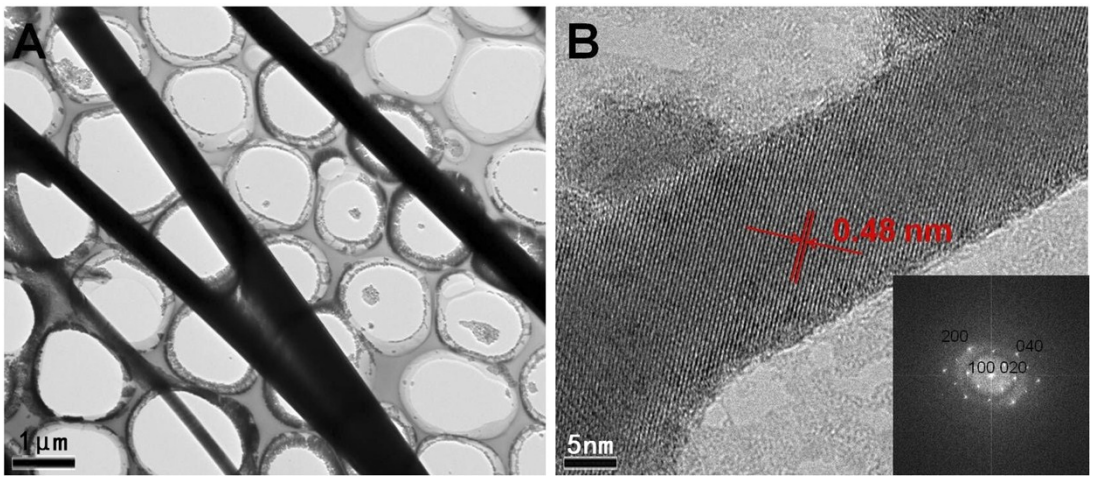
Chemicals: Cs_2CO_3 (99%, Adamas), octadecene (ODE, 90%, Acros), oleic acid (OA, 90%, Aldrich), $PbBr_2$ (99.99%, Xi'an Polymer Light Technology Core), PbI_2 (99.99% Xi'an Polymer Light Technology Core), oleylamine (OLA, Aldrich, 70%), oleylamine (99.9%, Acros). All chemicals were used as received without further purification.

Preparation of $CsPb(Br/I)_3$ nanorods: Caesium stock solution was obtained by dissolving 100 mg $CsCO_3$ powder in 300μl oleic acid (OA) and 3.75ml octadecene (ODE) in a 100 ml three-necked flask, the above stock solution were then heated to 120℃ under N_2 for standby. 22mg $PbBr_2$, 55mg PbI_2, 5ml ODE were mixed in a 100 ml three-necked flask, which was placed in a heating jacket with the environment of nitrogen and then heated to 120℃ with magnetic stirring, and then 800μl OA and 500μl oleylamine (OLA) were injected into the three-necked flask and then heated to 135℃ to keep half an hour until the solution turned into bright yellow. Following, extracting 600μl Caesium stock solution was injected into the precursor solution quickly which containing $PbBr_2$ and PbI_2 when the temperature of the solution was maintained at 135℃ for 1,5,10,15,20,30 minutes until the solution turned to dark red. Finally, the $CsPb(Br/I)_3$ nanorods were obtained. The $CsPb(Br/I)_3$ nanorods was purified by using toluene to resolve the unreacted OA and OLA, pure $CsPb(Br/I)_3$ nanorods were obtained after several purification, and then the $CsPb(Br/I)_3$ nanorods were dispersed in toluene for testing.

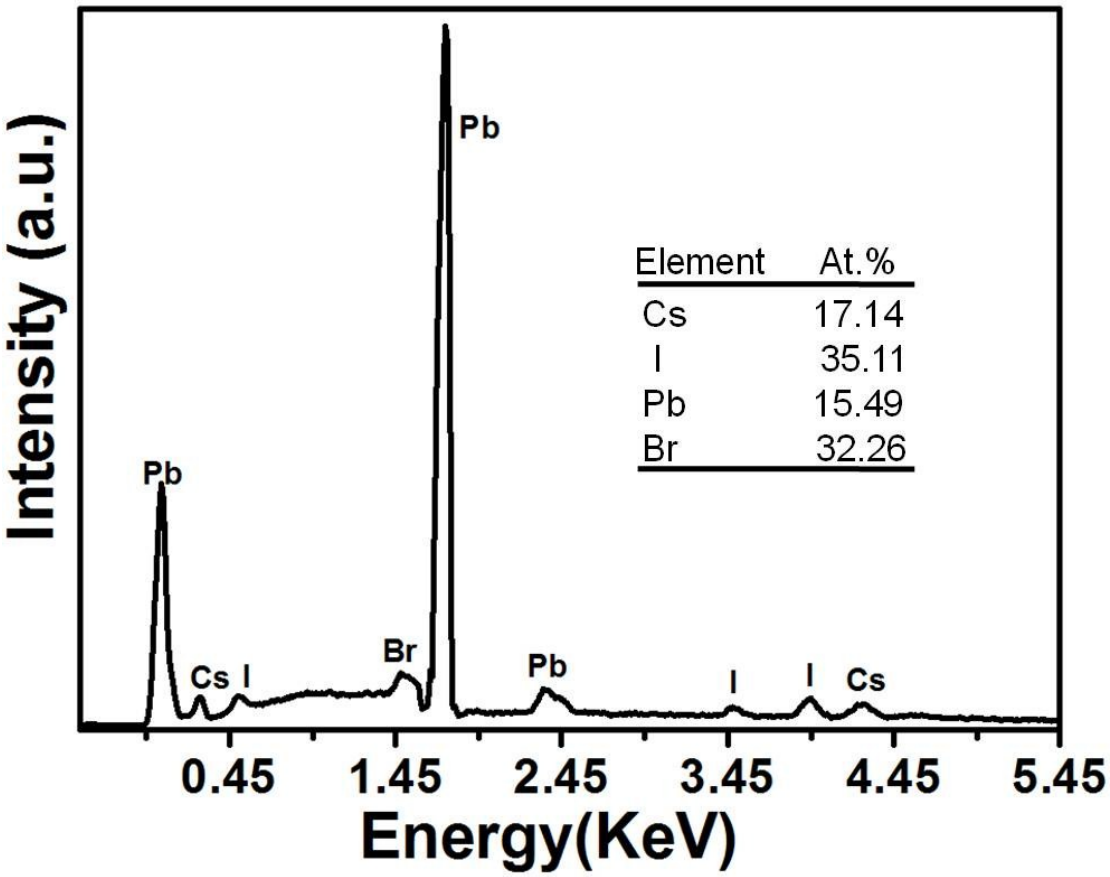
Characterization of $CsPb(Br/I)_3$ nanorods: The crystal phases of all samples were characterized by X-ray diffraction (XRD) with CuKa radiation (XRD-6100, SHIMADZU, Japan). The absorption was adopted by a Scan UV-vis spectrophotometer (UV-vis: UV-2100, Shimadzu, Japan). The photoluminescence spectroscopy were measured by a fluorescence spectrophotometer (PL: Agilent Cary Eclipse, Australia) which included a Xe lamp as an excitation source with optical filters). The transmission electron microscopy was tested by a ZEISS LIBRA 200FE microscope. The on/off photocurrent ratio of the $CsPb(Br/I)_3$ nanorods was obtained by a source meter (Keithley 4200).



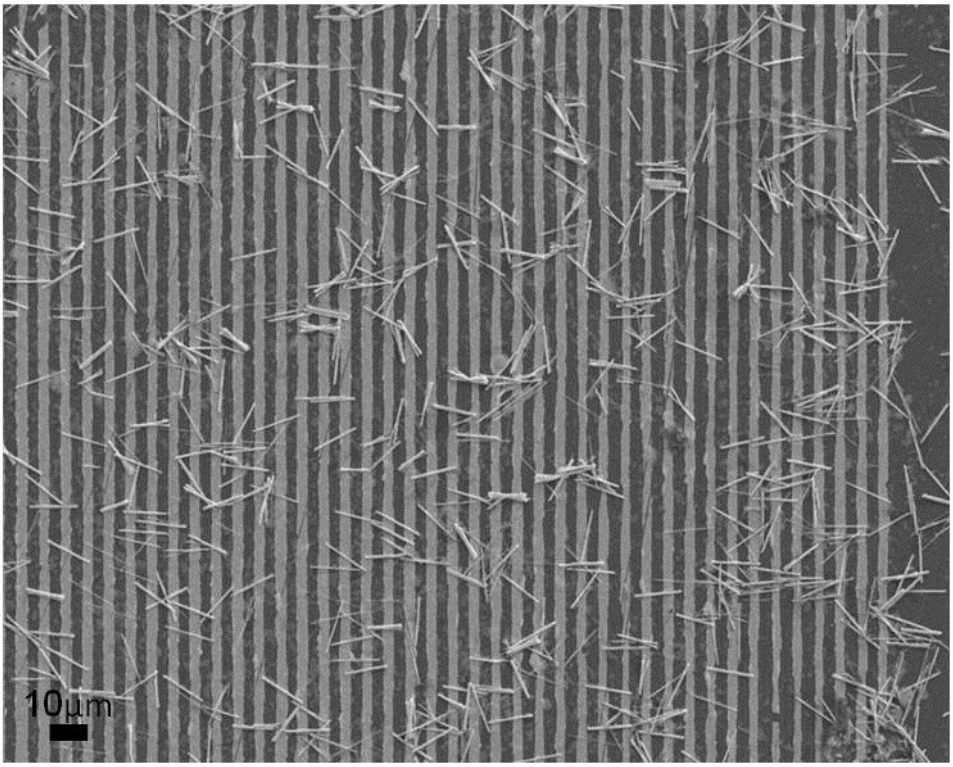
S_Figure. 1 The synthesis of $CsPb(Br/I)_3$ nanorods at 135℃ for 1, 5, 10, 15, 20, 30 minutes.



S_Figure. 2. (A) TEM images of the $CsPb(Br/I)_3$ nanorods. (B) High resolution TEM image of $CsPb(Br/I)_3$ nanorods and the SAED of the $CsPb(Br/I)_3$ nanorods.



S_Figure. 3 EDS spectrum of the $CsPb(Br/I)_3$ nanorods.



S_Figure. 4 SEM image of real photodetector device which a great many nanorods which were set up between the two Au electrodes.