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# Large-scale growth of lead iodide hydroxide microwire crystal for an X-ray detector

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Very recently, lots of efforts focused on one dimensional (1D) laurionite-type lead halide hydroxide Pb(OH)X (X=Cl, Br, I) due to their extraordinary structural and spectral characteristics. In this paper, we report a successful facile growth of freestanding lead iodide hydroxide (Pb(OH)I) microwire crystal via hydrothermal method without additives. The properties of the samples were investigated by SEM, EDS and single crystal X-ray diffraction. The results show that Pb(OH)I microwire crystal is an indirect band gap semiconductor material (2.823eV) based on density functional theory (DFT). Moreover, the Pb(OH)I microwire crystal based photodetector respond to x-ray incident light with a fast, repeatable and stable response characterized by a reasonable response and decay times (0.13s and 0.29s, respectively). These results substantiate the potential of Pb(OH)I microwire crystal as a candidate material in optoelectronic applications.

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