

Pressure-Induced Crystallization of Metal Lead Halide Perovskites for High Performance Photoelectronic Devices

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Metal lead halide perovskites have been focused as a promising next generation photoelectronic materials. Compositional and deposition approaches have contributed to boosting the photoconversion efficiency and its stability against air and moisture. Although its unprecedented performance breakthrough, metal halide halide perovskites suffer from stagnation in terms of photoconversion efficiency. As a strategic modification, we introduced pressure-induced crystallization method, which can tailor not only nanostructure but also intrinsic properties of metal lead halide perovskites itself resulting in performance efficiency. By exerting pressure with simple and easy-to-follow technique, we developed high-performance photodetectors utilizing nanopillar-structured metal lead halide perovskites, which exhibited enhanced photoresponsivity. Additionally, we successfully fabricated nanodot-arrayed metal lead halide perovskite films, which shows enhanced film stability against moisture.