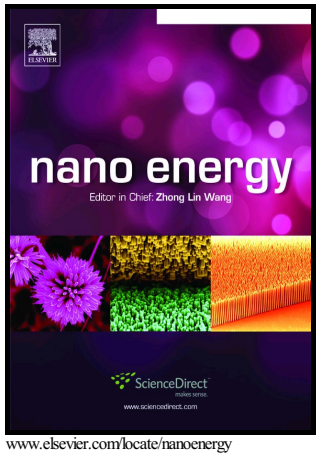

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ABSTRACT

Perovskite-based photodetectors show a great promise thanks to the material's excellent photogeneration and broadband device operation. Amongst the fundamental limitations of halide perovskites, humidity-induced degradation arises as the main impediment towards viable commercial-grade perovskite-based technologies. Here, we report a stable, reproducible and reliable pseudo halide perovskite nanowire network-based photodetector with superior performances. The perovskite nanowire network is deposited using a two-step spin-coating process atop patterned substrates under ambient conditions with relative humidity (RH%), higher than 50 %. Because of the particular 1D perovskite nanowire morphology, our devices require no charge collectors, which reduces fabrication steps and costs. Most importantly, we demonstrate that incorporation of lead thiocyanate ($Pb(SCN)_2$) directly in the precursor solution promotes the synthesis of stable hybrid perovskite nanowire networks in ambient conditions. These devices exhibit response time as fast as 50 µs and responsivities up-to ~0.23 $A.W^{-1}$ at 2 V bias. Also, the optimum photodetector exhibited high specific detectivity of 7.1 x 10^{11} $cm.Hz^{1/2}.W^{-1}$. This novel and yet simple device architecture

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