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Perovskite semiconductors for thin film field effect transistors

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Abstract

The Perovskite is considered as the most alluring successor to the conventional semiconductors to fabricate channel materials in the thin film field effect transistors. The complicated and expensive manufacturing techniques are being used to deposit the silicon semiconducting thin films on the substrates. But the introduction of Perovskites made a revolutionary pathway in electronics by much easier and less expensive processing techniques to the deposition of thin films on the insulator surfaces to construct field effect transistors. The perovskite FETs have used in various applications including lasers, radiation detections, light emitting FETs etc., due to their unique opto-electronic properties. Moreover, perovskite-based FET enables direct measurements of the perovskite material's electronic properties. In this work we reviewed the evolution and properties of perovskite thin film FETs and their applications. The extremely scalable and quite inexpensive synthetic and fabrication techniques of these materials under ambient conditions are the other major advantages. As the Perovskite based solar cells were commercialized, the above-mentioned applications are not far from being commercialized.

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[<< Back to Proceedings](#)