



Perovskite Oxide Material Based Thin Films Prospect and Applicability

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Editorial

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Abbreviation: MRMAM: Magnetic Random Access Memory.

Editorial

In this current dispensation and quest for material thin film that exhibits ranges of applications in various areas due to its wide spectrum of attractive properties such as ferroelectricity, piezoelectricity, ferromagnetism dielectric, magneto-resistance, multiferroic with high efficiency in solar energy conversion couple with the fact that some are good for passivation of layer of metals and then invariably minimize metal corrosion. Based on these features of the thin material, it has attracted a greater level of attention in every where around the corners of the world among the nanoscientists for several decades, though there have been challenges in coming up with the materials in terms of process that would enhance getting reliable perovskite oxide based thin film with reproducible properties, it has not been easily tenable because the complexity in preparing such materials with precise stoichiometry of desired properties.

Basically, these major three groups of the perovskite material thin films processes could be physical, vapor deposition, chemical vapor deposition and chemical methods. For instance, chemical bath deposition, electrodeposition, pulse laser deposition, vacuum evaporation, thermal

evaporation, sputter deposition, successive ionic layer adsorption can be used to synthesize any categories of perovskite material thin films, but as the case may be it is obviously clear that amongst all enumerated methods above, chemical bath deposition technique is considered more advantageous due to its low cost effectiveness, large area production, easily control of size coupled with its simplicity instrumental operation.

In conclusion, the synthesis of these three categories of perovskite based oxide materials viz binary, ternary and quaternary materials is a welcome development as a promising candidates for applications in such areas as in voltaic solar cell, multilayered ceramic capacitors ferroelectric memories, voltage tunable capacitors, surface acoustic wave devices, microactuators, and infrared detectors coupled with their emerging applications inclination in the development of multifunctional device controlled by magnetic and electric field which is appealing for spintronics that is based on control of magnetization of a ferromagnet, exchange coupled to a ferroelectric antiferromagnet, through an electric field. As matter of fact, it is good candidate for electrical writing of magnetic information with a lower energy consumption just as in magnetic random access memory (MRMAM) etc.

However, it is still required that in order to obtain perovskite oxide based materials with excellent performance; the properties of the thin films could be optimized through continual research by nonscientists in order to achieve the optimal utilization of the applications of the materials.

