

**REVIEWER'S REPORT**

Manuscript No.: IJAR- 56319

**Title:** Electrical and Morphological Characterization of Solution-Processed GelPZN-PT Perovskite Nanoparticles Thin Film for Transistor Dielectrics**Recommendation:**

Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality	Yes			
Clarity	Yes			
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

***Detailed Reviewer's Report*****Reviewer's Comment for Publication.**

Acceptance Comment are mentioned below suitable for the paper titled "Electrical and Morphological Characterization of Solution-Processed GelPZN-PT Perovskite Nanoparticles Thin Film for Transistor Dielectrics"

**Reviewer Comments: Accept****Reviewer Comments –****1. Introduction**

The manuscript presents a clear and relevant introduction to thin film field-effect transistors (TFTs) and emphasizes the importance of high-k dielectric materials for low-voltage and high-performance electronic devices. The study effectively highlights the need for advanced dielectric materials with enhanced electrical properties for flexible and large-area electronics. The research objective—investigating Mn-doped and undoped PZN-PT perovskite nanoparticles for transistor dielectric applications—is well justified and aligned with current technological developments.

**2. Literature Review**

The study provides adequate background on perovskite-based dielectric materials and their applications in transistor technologies. The manuscript demonstrates an understanding of prior work related to ferroelectric materials, high-k dielectrics, and solution-processed thin films. However, the literature review could be further strengthened by incorporating more recent studies on Mn doping effects and

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comparative performance analysis with other dielectric materials. Overall, the review sufficiently supports the research motivation.

### 3. Solution Approach / Methodology

The experimental methodology is well structured and appropriate for the research objectives. The preparation of Mn-doped and undoped PZN-PT thin films using the spin-coating technique on doped silicon substrates is clearly described. The use of scanning electron microscopy (SEM) for morphological characterization and electrical measurements for device performance evaluation is suitable. The fabrication of metal–oxide–semiconductor (MOS) structures with silver contacts provides a reliable approach for analyzing dielectric behavior. The methodology demonstrates scientific rigor and reproducibility.

### 4. Results and Discussion

The results are systematically presented and supported by experimental observations. SEM analysis clearly shows that Mn-doped PZN-PT films exhibit improved microstructural properties, including higher density and better homogeneity. Electrical characterization confirms transistor operating behavior and demonstrates the influence of ferroelectric polarization on device performance. The discussion effectively explains the enhanced current values and improved electrical stability observed in Mn-doped films compared to undoped samples. The findings are logically interpreted and show significant improvement in device characteristics.

### 5. Conclusion

The conclusion summarizes the major findings effectively and highlights the potential of Mn-doped PZN-PT thin films as promising dielectric materials for transistor applications. The study successfully demonstrates improved electrical performance and structural properties through Mn doping. The conclusions are consistent with the experimental results and contribute to the advancement of high-performance dielectric materials for electronic devices.