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REVIEWER'S REPORT

Manuscript No.: IJAR-55732

Title: Effect of Temperature, Physical Aging, and Moisture Absorption on Positron Lifetime Parameters in Cured Polyester Resin Studied by Positron Annihilation Lifetime Spectroscopy

Recommendation:

Accept as it is
Accept after minor revision.....
Accept after major revision
Do not accept (*Reasons below*)

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

Reviewer Name: Dr. Sumathi

Detailed Reviewer's Report

1. **Positron annihilation is the process where a positron (an antiparticle of an electron) meets an electron, and both disappear, converting their mass entirely into energy, usually in the form of two high-energy gamma-ray photons emitted in opposite directions to conserve momentum and energy.**
2. **This fundamental physics event is crucial in medical imaging (like PET scans) and materials science (Positron Annihilation Spectroscopy - PAS) to detect defects or map structures, as the specific energy and timing of the gamma rays reveal information about the annihilation site.**
3. **The ortho-positronium (o-Ps) lifetime varies significantly: about 142 nanoseconds (ns) in a vacuum, decaying into three gamma rays, but dramatically shorter (nanoseconds to picoseconds) in matter due to "pick-off" annihilation with surrounding electrons, with typical values around 3 ns in organic liquids (like scintillators) and shorter in denser materials, making it useful for sensing material voids and composition.**
4. **Physical aging is the natural, gradual decline in the body's structure and function over time, involving cumulative cellular damage that**

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reduces resilience and increases disease risk, affecting everything from bones, muscles, and senses to organ systems, but its pace and severity vary based on genetics, environment, and lifestyle.

5. Key changes include loss of muscle/bone density, slower metabolism, vision/hearing decline, stiffer arteries, and reduced immune function, impacting overall mobility, strength, and health.
6. Free volume is the empty space or interstitial volume between molecules in a material, allowing for their movement, and is crucial for understanding material properties like diffusion, viscosity, and the glass transition in polymers and liquids.
7. It's the excess volume beyond the perfectly packed state, existing as tiny "holes" or gaps that change with temperature and density, enabling molecular rearrangements and flow, especially in amorphous materials.
8. Key words are given good with excellent.
9. Result part is given good with pictures and significant points.
10. But should be given discussion part is separately.
11. Summary points must be needed.
12. References should be in alphabetical order.
13. After those changes good to publish in your journal.