

# Review of: "Experimental Behavior of Solar Still Using Mixed Oxides Mn-Fe/Silicon Resin Composite as Selective Solar Absorber"

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Potential competing interests: No potential competing interests to declare.

From the abstract, has the author given a clear idea about what methodologies were employed to assess the durability of the hybrid material (2.3% Mn-Fe mixed oxides) used as a selective coating in the solar still, particularly in terms of its stability in corrosive and hot environments over extended periods of time?

I have been requested as a reviewer for a paper in a journal. As a reviewer of the article, I have to ask some questions/comments/suggestions for the content attached inside the bracket.

In Materials and Methods,

The author must give the evaluation of condenser transmittance is crucial for optimizing solar still performance. Could the authors elaborate on the criteria used to determine the optimal thickness of the glass cover? Additionally, were there any unexpected findings or challenges encountered during the transmittance evaluation process that could provide valuable insights for future researchers?

The paper utilizes various characterization techniques, including X-ray diffraction and spectrophotometry, to analyze the optical properties of the materials. While these techniques are standard, could the authors discuss any potential limitations or uncertainties associated with each method? Providing a brief overview of the advantages and drawbacks of each technique would help readers better interpret the results.

From section 3.3

Could the authors provide insights into the practical implications of the observed variations in spectral transmittance and solar absorption for different thicknesses of float glass and concentrations of Mn-Fe pigment oxides? How might these findings inform the design and optimization of solar distillation systems in terms of maximizing energy efficiency and water production?

From section 3.5

Could you elaborate on the specific methods used to calculate water production per hour, latent evaporative heat, and the radiation received from the sun at each hour of the day? Understanding the calculation methodology would enhance the clarity and reproducibility of the study's findings.

The paper mentions that the characterization of the device was carried out during periods with lower daily irradiation. It would be beneficial to discuss how the thermal efficiency and water production are expected to vary across different seasons, particularly during periods of higher solar irradiance like summer. Are there plans for further experimentation

during summer months to validate these expectations?

The reported maximum efficiency of 27% is noteworthy. However, could the authors provide a discussion on how this efficiency compares to similar solar distillation devices reported in the literature? Contextualizing the findings within the broader research landscape would add depth to the interpretation of the results.

Figure 7 provides valuable insights into the temperature profiles and irradiance throughout the day. However, could the authors consider providing additional visualizations or data plots to further illustrate the relationships between these variables and their impact on the device's performance?

From section 3.6

The paper mentions that the distilled water meets the standards set by the Mexican standard NOM-127-SSA1-1994. Could the authors elaborate on the specific parameters measured and how they compare to the standard requirements? Additionally, considering the importance of water quality for human consumption, it would be beneficial to discuss any potential implications or limitations in the context of broader water treatment standards or guidelines.

From Conclusion

Could the authors provide more insight into the sustainability aspects of the prototype beyond thermal efficiency? For instance, were renewable or recycled materials utilized in its construction, and were any energy-intensive processes minimized during its fabrication? Additionally, while the prototype is described as low-cost, could the authors provide an estimate of the total cost of construction and compare it to other solar distillation solutions in the literature?

Finally, I suggest revisiting the conclusion section to ensure that the key findings and implications are effectively summarized and highlighted. This would provide readers with a clear takeaway message and reinforce the significance of the research in addressing critical water and energy challenges.