Qeios

Peer Review

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

Sana Ullah[1]

1. City University of Hong Kong, Hong Kong

The study investigates the optical properties of a black pigment comprising mixed Mn-Fe oxides dispersed in silicone resin, applied to various thicknesses of float glass for constructing a passive solar still. Spectral absorbance, emittance, and morphology were evaluated, alongside x-ray diffraction analysis. Optimizations were made based on these findings, resulting in a hybrid material with 2.3% Mn-Fe mixed oxides exhibiting high solar absorbance (91.82%) and low infrared thermal emission (<57.22%). The prototype achieved a thermal efficiency of 27%, solely relying on solar energy, producing distilled water meeting official standards for human consumption. This study contains enough information; however, the following concern should be addressed before publication;

1. The introduction of the paper provides a broad overview of solar distillation, various designs of solar stills, significance of selective absorber coatings, and need for improvements in solar still technology to address water scarcity issues. However, the title, "**Experimental Behavior of Solar Still Using Mixed Oxides MnFe/Silicona Resin Composite as Selective Solar Absorber**," suggests a specific focus on experimental observations and analysis related to the behavior of solar stills using a particular composite material as a selective solar absorber. This discrepancy between the broad introduction and specific title highlights an alignment issue. To address this, the introduction should be revised to provide more direct relevance to the experimental study described in the title, emphasizing the use of mixed oxides MnFe/silicona resin composite and its significance in improving solar still performance.

doi.org/10.32388/S06Q44

2. In XRD results, only the vertical lines of different colors are provided, which are misleading. Therefore, all the data should be provided. Additionally, if the author believes that a cubic structure is present, relevant papers should be cited. The XRD pattern should be labeled with the preferred Bragg notation, such as ().
3. Absorbance and absorption are two different concepts. The absorbance is expressed as a dimensionless quantity calculated using the logarithm of the ratio of transmitted to incident light intensity. While the percentage of absorption can be calculated from transmittance and reflectance measurements, absorbance is not typically expressed as a percentage, hence figure 3 should be revised.
4. All the equations should be rewritten; there are writing mistakes.
5. Tables should be rearranged, and the units in the given table should be aligned with the corresponding text in the paper.

Minor: There should be a space between the quantity and the unit.

Declarations

Potential competing interests: No potential competing interests to declare.