

Review of: "Nanomaterials: History, Production, Properties, Applications, and Toxicities"

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Potential competing interests: No potential competing interests to declare.

The contribution is sound & original. It addresses the multi-faceted aspects of nanosciences & nanotechnologies. It has started with a comprehensive historical background, followed by the advantages & potentials offered by nano, ending with a broad discussion on the risks related to nanomaterials. The manuscript is crystal clear & very well written. It is recommended for publication once the following Precisions (P), Corrections (C), & Recommendations (R) are addressed, each & all:

PCR-1:

In view of completing the comprehensive aspect of nano, it is necessary to mention Tanigushi, who was the first to coin the term "nano." Hence, the authors are encouraged to refer to the following publications that they should include in their introductory discussion and add them to their reference section:

- (i) N. Taniguchi, "On the basic concept of nanotechnology," in Proc. of the Int. Conf. on Prod. Eng., 1974, pp. 18–23.
 - (ii) C. N. R. Rao, and K. Biswas, "Characterization of nanomaterials by physical methods," Annu. Rev. Anal. Chem, vol. 2, no. 1, pp. 435–462, 2009, doi: 10.1146/annurev-anchem060908-155236.
 - (iii) A. Santamaria, "Historical overview of nanotechnology and nanotoxicology," in Methods in Molecular Biology: Nanotoxicity, J. Reineke, Ed., Totowa, NJ, United States: Humana, 2012, pp: 1–12, doi: 10.1007/978-1-62703-002-1_1.
- [3]

PCR-2:

Likewise, the authors have omitted to stress significantly the pivotal intrinsic properties of nanomaterials, specifically size & shape effects. Accordingly, the authors are encouraged to refer to the following publications that they should include in their discussion and add them to their reference section:

- (i) B. D. Ngom, T. Mpahane, E. Manikandan, "ZnO nano-discs by lyophilization process: Size effects on their intrinsic luminescence," J. Alloys Compd., vol. 656, pp. 758–763, 2016, doi: 10.1016/j.jallcom.2015.09.230.
- (ii) M. Henini and F. Ezema et al., Peculiar Size Effects in Nanoscaled Systems *Nano-Horizons*. 2022. Vol. 1(1). DOI:

10.25159/NanoHorizons.9d53e2220e31

PCR-3:

It would have been appreciated if the authors used recent nano-literature, as many new advances were made since the launch of the USA NNI during the Clinton Administration. As typical examples, one could mention the fast-rising hot topics of nanofluids, 2-D nanosystems, as well as bio-engineering of nanomaterials. Accordingly, the authors are encouraged to refer to the following publications that they should include in their discussion and add them to their reference section:

(i) Mbambo, M.C., Khamlich, S., Khamliche, T. *et al.* Remarkable thermal conductivity enhancement in Ag—decorated graphene nanocomposites based nanofluid by laser liquid solid interaction in ethylene glycol. *Nature Scientific Reports* **10**, 10982 (2020). <https://doi.org/10.1038/s41598-020-67418-3>

(ii) Khamliche, T., Akbari, M. *et al.* A novel approach for engineering efficient nanofluids by radiolysis. *Nature Scientific Reports* **12**, 10767 (2022). <https://doi.org/10.1038/s41598-022-14540-z>

(iii) Botha, N.L., Cloete, K.J., Welegergs, G.G. *et al.* Physical properties of computationally informed phyto-engineered 2-D nanoscaled hydronium jarosite. *Nature Scientific Reports* **13**, 2442 (2023). <https://doi.org/10.1038/s41598-022-25723-z>

(iv) Numan, N., Jeyaram, S., Kaviyarasu, K. *et al.* On the remarkable nonlinear optical properties of natural tomato lycopene. *Nature Scientific Reports* **12**, 9078 (2022). <https://doi.org/10.1038/s41598-022-12196-3>

(v) Khanyile, B.S., Numan, N., Simo, A. *et al.* Towards Room Temperature Thermo-chromic Coatings with controllable NIR-IR modulation for solar heat management & smart windows applications. *Nature Scientific Reports* **14**, 2818 (2024). <https://doi.org/10.1038/s41598-024-52021-7>

(vi) Giday Gebregziabher Welegergs, N Numan and S Dube *et al.* Room Temperature Surface Bio-Sulfurisation via Natural Sativum Annilin and Bioengineering of Nanostructured CuS/Cu 2S. *Nano-Horizons*. 2023. Vol. 2. DOI: 10.25159/NanoHorizons.45486dad4f94