Review of: "The Influence of Hot Extrusion on The Mechanical and Wear Properties of an Al6063 Metal Matrix Composite Reinforced With Silicon Carbide Particulates"

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Potential competing interests: No potential competing interests to declare.

Review report

Manuscript Title:

The Influence of Hot Extrusion on The Mechanical and Wear Properties of an Al6063 Metal Matrix Composite Reinforced With Silicon Carbide Particulates

Manuscript ID: Qeios ID: DLUOH9

Dear Editor,

This article examines the mechanical and wear behavior of the aluminium 6063 alloy reinforced with silicon carbide in both as-cast and hot extruded conditions. The study found that reinforcement improved mechanical properties and wear resistance, particularly when subjected to hot extrusion, demonstrating the importance of lightweight composite materials in industrial and structural applications. In the final evaluation, in my opinion, it is good work, but it should be improved. However, I conclude that the reviewed article is appropriate for publishing in ***Qeios*** after major revision.

Kind Regards,

K. Rahmani

Comments on the paper are given as follows:

1. The Introduction should be increased; it is too short.
2. The novelty of the study should be described in the last paragraph with in-depth explanations related to its difference from previous research works.
3. Some literature should be meaningful for authors about composite material and Hot Extrusion in the introduction: (1) A study on damage evolution in Cu–TiO2 composite fabricated using powder metallurgy followed by hot extrusion; (2) Mechanical and corrosion properties of Mg–MgO and Mg–Al2O3 composites fabricated by the equal channel angular extrusion method.
4. The authors should compare the results of this work with already existing work.

5. What are the advantages and disadvantages of the current subject compared to other subjects? Authors are invited to comment on this situation.
6. The resolution of images should be improved, especially Figs 14, 15, 16, and 17, and, also, they should be merged by a,b,c,….
7. Some references are missing such as the ASTM G99 standard, ASTM B557M, and ASTM E-9 standards…. (repeated word 'standard')
8. The paper has been prepared as a technical report. Additionally, it needs more scientific investigation of the reported results. Authors are invited to extend the paper's results and avoid only reporting the test results. The paper should have more depth in the analysis of the results and especially in the justification of these results.
9. The detailed tribological mechanism should be fully discussed; it is poor.

Article, "The influence of hot extrusion on the mechanical and wear properties of an Al6063 MMC reinforced with SiC particulates," needs revision.

1. The abstract can be more refined and detailed; avoid generic information.

2. The introduction can be revised further. Refer to the articles "Automotive lightweight multi-material sheets joining through the friction stir welding technique: An overview," "The utilization of coconut shell ash in the production of hybrid composites: Microstructural characterisation and performance analysis," "Influence of the tool rotational speed on the mechanical and corrosion behaviour of friction stir processed AZ31/Al2O3 nanocomposites."

3. Mention the manufacturing details of the particle size analyser used in the current study.

4. The authors need to mention the possible errors of the experiment.

5. XRD and EDS are missing.

6. Provide a fractography analysis of the tensile and hardness tests. Refer to the articles "Effect of Rotational Speed on Mechanical, Microstructure, and Residual Stress Behaviour of AA6061-T6 Alloy Joints through Friction Stir Welding," "Some studies on the Heat-Affected Zone (HAZ) toughness behavior of API 5L X52 steel."

7. Rewrite the conclusions; please understand that the Conclusion chapter is not a summary of your work. Present only original and industrially significant revelations that have the potential to expand the horizon of human knowledge.

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Dear Editor,

The research purview is in line with current trends of the field; moreover, the author should explicitly detail the gaps in literature that the research impacted, further highlighting the unique perspectives that beautifully portray the novelty of the research and the efficiency of the approach, shedding light on how it outshines prior ways. The author did a good background overview but should include a brief highlight of modern discoveries about Ai6063 metal, citing recent contributors. In the same vein, a comparison of the metal to other modern alloys and its competitive advantage should be detailed. The author showed good properties of the composite but should delve further into detailing how the resulting strengths of the composite compare with similar processes on comparable composites, not only on unreinforced samples, and showcasing distinguishing features. The study did well to showcase SEM analysis; nonetheless, the author should highlight possible oversights, omissions, and gaps that could have happened, further revealing grey areas for future study. The study showed the resulting wear rate of the composite; however, the study should further reveal from modern research the reasons for the wear rate and make cogent recommendations on the same, as this is paramount to the researched problem.

The study has, with laser precision, contributed to knowledge in this field; the result is worthy of note and opens up insight for further studies on lightweight metallic alloys with significant advantages; consequentially, this is much needed for applications in the modern world. Kindly ensure revealed improvements are made and the research accepted for publication.

Warm regards,

Ademati Akeem.