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.

In the present research, the authors try to investigate the influence of hot extrusion on the mechanical and wear properties of the Al6063/SiC composite. The authors give some results in the content, but there are some questions.

1. The present research mainly focuses on the mechanical and wear properties of the SiC-strengthened Al6063 alloy. Though they give some properties, it is unclear in which field the composite could be applied. That would determine the suitability of these properties. The authors are suggested to describe this clearly in the introduction section.
2. In the experimental section, the authors should describe the amount of SiC addition in the composite.
3. In the content, the authors describe that there are four kinds of composites with SiC additions of 2%, 4%, 6%, and 8%, respectively. It is unclear how the authors confirmed the addition of SiC content in different composite specimens?
4. In the content, the authors exhibit the properties without any microstructure characterization. What are the main factors influencing these properties? How to explain the influence of hot extrusion? Actually, the hot extrusion could change the microstructure and mechanical properties. The authors could refer to the previous research papers “Microstructure evolution and mechanical properties of Ni3Al/Al2O3 composite during self-propagation high-temperature synthesis and hot extrusion. Materials Science and Engineering: A 2012,555, 131-138” and “Microstructural characteristics and mechanical properties of the hot extruded Mg-Zn-Y-Nd alloys. Journal of Materials Science & Technology 2021,60, 44-55”.
5. In the content, the tensile and compressive curves should be given for better understanding. The fracture surface should be observed by the SEM to explain the effect of extrusion and strengthening phase content.
6. Why do the authors define the wear test as an adhesive wear test?
7. In the wear test, why do the authors define the wear rate as μm? Is it different from the conventional test? The authors should refer to the recent research papers “Improving superficial microstructure and properties of the laser-processed ultrathin kerf in Ti-6Al-4V alloy by water-jet guiding. Journal of Materials Science & Technology 2023,156, 32-53” and “Influence of layer number on microstructure, mechanical properties and wear behavior of the TiN/Ti multilayer coatings fabricated by high-power magnetron sputtering deposition. Journal of Manufacturing Processes 2021,70, 529-542”.
8. In the section on wear properties, the same results have been displayed in different figures, which is somewhat confusing. Actually, there is little discussion on the variation of wear properties. The change in form makes nonsense.
9. The observation of worn surfaces is so ambiguous. The other figures also raise the same question. The authors are suggested to provide clear figures in the entire manuscript.