Review of: "Investigating the Mechanical and Tribological Effects of MoS2 Reinforcement in AZ91 Magnesium Alloy: A Comprehensive Experimental Study"

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Potential competing interests: No potential competing interests to declare.

Weakness points and remarks

Introduction:

- Add a reference to the third paragraph.
- What are the process parameters to be studied?
- The novelty of the work should be clarified.

Experimental

- The source or producer and type of all materials should be specified.
- Process parameters for the milling machine used for producing nano MoS_2 should be mentioned. SEM images with sizes in nanometers should be added for the nanopowder.
- The paragraph describing the properties of MoS2 should be moved to either the introduction or results part. Proper references should be inserted.
- The quality of the tables should be improved. Table 2 should show all the process parameters for the FSP process.
- The type and working parameters of all devices used for materials characterization should be mentioned (hardness, optical microscopy, SEM, tensile machine).
- What are the dimensions of the tensile test samples?
- What was the etching solution used for microstructure investigation?
- A wear test should be conducted.

Results and discussion

- There is no discussion for any of the obtained results (with the aid of proper references).
- From microstructure images, the MoS2 particles are in the micrometer range, not in the nanometer range.
- Is the hardness measured by Brinell or Vickers?
- There is no significance for Figure 2.
- The quality of the microstructure should be improved. It is better to use SEM. The grain refining effect of the rpm of FSP is not clear.
- The figure titles should be carefully revised, and they should reflect their content. For example, Figure 3.

‘Microstructure and stress-strain curve for the sample at 1100 rpm."

- Same for figures 4, 5
- Add results from mechanical tests and hardness measurements in a tabulated format.
- Remove subtitles for samples 700 and 900 rpm.
- The results should be rearranged. We start with low rpm, followed by higher ones.
- SEM analysis: The images do not represent EDS chemical analysis. They only show surface topography. The authors should differentiate between SEM images and EDS chemical analysis (Figure 6, 7).
- Explain the topography of the fracture obtained in Figure 7.

Conclusions

- The authors referred to wear properties; where are the results?
- It should not simply summarize the data or test procedure. What did the authors conclude from this work?

Reference

- Check the references' formatting as well as the missing information for some references