

# Review of: "Investigating the Mechanical and Tribological Effects of MoS<sub>2</sub> Reinforcement in AZ91 Magnesium Alloy: A Comprehensive Experimental Study"

Ali Sadooghi<sup>1</sup>

<sup>1</sup> Shahid Rajaei Teacher Training University

Potential competing interests: No potential competing interests to declare.

Dear Editor in Chief, Journal of Qeios

I have read the whole manuscript, and the below sentences are my ideas and comments regarding the authors' research. This study investigates the impact of the processing parameters on the friction stir processing (FSP) of AZ91 and a Mg alloy reinforced with MoS<sub>2</sub>. Notably, this experiment used the hole technique instead of the more common groove method. While the groove method dominates FSP applications, this project employs a 2 mm drill technique. In my point of view, some points were missed:

1. The written abstract must be rewritten, and more obtained quantitative results should be added.
2. What is the novelty of this research? There are many research similarities to this project and Mg composites.
3. The written literature review is not appropriate. The state-of-the-art manuscript must be added with coverage of the obtained results and relevance to the subject.
4. All the figures must be changed with more quality images.
5. The materials and methods section is too wordy; there are lots of worthless sentences about Mg and MoS<sub>2</sub>.
6. What are the reasons for choosing these parameters of Table 2?
7. How many tests were done on samples for the hardness test? Please list the obtained results and calculate the deviation.
8. What do you mean about these sentences: the Table 3 is shown the hardness results.

"As shown in Table 3, the average grain size within the stir zone (SZ) of the AZ91-FSP specimens was reduced to approximately  $1.4 \pm 0.5 \mu\text{m}$ , compared to the  $7.4 \pm 1.0 \mu\text{m}$  of the full-annealed samples."

1. Please mention a reference for this sentence.

"This refinement is likely attributable to the dynamic recrystallization (DRX) effect induced by the high strain rate and the frictional heat generated during the FSP process."

1. Are you sure about the tensile test results? The obtained graph does not seem correct, especially the oscillation of the first part of the graph.
2. The SEM images are not appropriate in point of quality view. And an SEM map is recommended to be added for better

understanding of the involved particles and their distribution.

3. What was the shape and dimension of the tensile test samples?

4. Please add more explanation about the obtained results.