

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.

Reviewer Comments

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

Title

- Title should be properly reframed ("Investigating" is not correct)

Abstract

- Abstract should not contain introduction part
- Abstract consists of the objectives and processing parameters only rather than results and outcome of the work
- Abstract should brief about the work that has been carried out mainly focusing on the results
- The authors have to discuss the past research carried out on the AZ91Mg alloy with MoS₂ and should clearly state the need of the present work that has been carried out. This aspect is not dealt with in the introduction

Introduction

- Introduction is poorly written
- Literature review is very shallow
- Research gap related to the current study is not addressed
- What has been mentioned in the abstract is repeated in the introduction, which is not allowed
- There is no one-to-one connectivity between the literature that is included in the manuscript and the current work that has been carried out

Materials and methods

- This section should describe only the materials required and methods employed in the work
- Details or description of MoS₂ should reflect in the results and discussion section
- Proper grammar is not used in this section

- Very poorly written
- Figure 1 has two pictures and they are not labelled
- Figure 1 should have been Figure 1: (a) caption (b) caption
- Lacks proper presentation of methods employed in the work
- No proper relevance for the quoted references
- This section should include only details about the material that is used in the work like its procurement or supplier, composition and quantity, and the description of the methods used for producing the alloy, process parameters, and the details about characterization techniques

Results and discussion

- Section title is not correct
- 'Result and discussions' is not correct, it should be 'Results and discussion'
- Not clear why References [15 – 17] are quoted in this section
- Not much variation in hardness at different speeds
- Whether Table 3 depicts hardness values or grain size is not clearly brought out
- FPS in Table 3 caption stands for what
- Difference in hardness values doesn't support the statement 'significant improvement in hardness at different speeds'
- Just quoting references [4, 6, 16, 18] doesn't convey any meaning
- Figure 3 is not properly labelled and caption is not properly written
- Relevance of Microstructures and stress strain curves at different speeds is not explained
- The need for 100x and 500x microstructures is not explained
- Figure 6 is not the EDS spectra of specimens as mentioned by the authors
- Figure 6 is actually SEM micrograph of the alloy
- Figure 7 depicts the SEM fractographs of the tensile specimens not EDS results

Conclusion

- This section looks like more or less the abstract
- Authors are not clear about SEM micrographs and fractographs, instead they have misinterpreted as EDS spectra showing the composition of the specimen
- 'Influence of microstructure on tensile properties' is not explained anywhere in the results and discussion section
- Without conducting wear testing, authors have concluded that the AZ91 Mg alloy has improved wear resistance

Based on the above comments, I won't recommend the manuscript for publication in the journal.