Review of: "Use of the experimental designs as an approach to optimize the inhibition efficiency of a Pyridazine derivative against corrosion of steel in an acidic medium"

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Potential competing interests: No potential competing interests to declare.

The article titled "Use of Experimental Designs to Optimize the Inhibition Efficiency of a Pyridazine Derivative Against Corrosion of Steel in an Acidic Medium" is a comprehensive study that investigates the effectiveness of experimental designs in optimizing the inhibition efficiency of a pyridazine derivative for protecting steel against corrosion in acidic medium. The article provides valuable insights into the development of new and efficient corrosion inhibitors, which can have significant implications in various industrial applications.

The authors of this article announce the synthetic pathway of the pyridazine derivative used in this study, but they do not discuss or show the experimental details of the synthetic pathway. This could potentially limit the reproducibility of the study and raise questions about the validity of the results obtained using the synthesized inhibitor. It is essential that authors provide sufficient details of the experimental procedures involved in the synthesis of the inhibitor to ensure reproducibility of the study.

Nevertheless, the authors have successfully demonstrated the use of experimental designs, specifically the Response Surface Methodology (RSM), to optimize the inhibition efficiency of the pyridazine derivative. The article presents a detailed experimental design, which involves the preparation of the pyridazine derivative, characterization, and evaluation of its corrosion inhibition efficiency using various techniques such as weight loss, polarization, and electrochemical impedance spectroscopy (EIS). The results of the study show that the optimized inhibitor concentration significantly reduces the corrosion rate of the steel in the acidic medium.

The article also provides a detailed discussion on the various factors that affect the corrosion inhibition efficiency of the pyridazine derivative. The authors have effectively explained the importance of considering the effect of each factor, such as concentration, temperature, and immersion time, on the inhibition efficiency. The article also presents a thorough analysis of the experimental data using statistical software and provides a model equation that describes the correlation between the inhibitor concentration and the corrosion inhibition efficiency.

In Conclusion:

Overall, the study presents an insightful investigation into the use of experimental designs to optimize the inhibition efficiency of the pyridazine derivative against corrosion of steel in an acidic medium. While the article effectively presents

the characterization and evaluation of the corrosion inhibition efficiency of the synthesized inhibitor using various techniques, the absence of experimental details of the synthetic pathway raises concerns about the quality and reliability of the synthesized inhibitor used in the study.

Therefore, I strongly recommend that the authors revise this manuscript and integrate the experimental section of the synthetic pathway and the discussion of this part in detail. This addition will provide valuable information for readers and ensure the reproducibility of the study. Additionally, the publication of this research article should take into consideration the remarks of other reviewers to ensure the accuracy and reliability of the study. Furthermore, the article should be revised by an English language expert to ensure that the language is clear and easy to understand.

The results of the study have significant implications in various industrial applications, especially in the development of new and efficient corrosion inhibitors. The article is well-written and structured, and the authors have effectively explained the importance of considering various factors in optimizing the inhibition efficiency. The study provides valuable insights for researchers and professionals working in the field of corrosion inhibition and materials science. Therefore, I would still recommend this article to readers interested in this subject, with the caveat that the experimental details of the synthetic pathway should be considered in the interpretation of the results.