

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 present manuscript reports the "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". The topic addressed is interesting and the authors did a good job. However, I suggest acceptance of this manuscript after major revision.

The following points should be considered:

1. Title too long. It is preferred to replace it with another attractive
 2. Abstract sentences are Weakley connected and doesn't highlight the importance of the work.
- Many sentences are not well framed
 - It can be written as follows:
1. It would be proper to expand a bit your good introduction to make the article more appropriate to the journal. Support it with literature concerning corrosion inhibition of mils steel in acidic media. As well You should mention in the introduction:
- Why steel.?

Cite these refs, they would help you in this:

- H. T. Rahal, A. M. Abdel-Gaber & G. O. Younes (2016) Inhibition of Steel Corrosion in Nitric Acid by Sulfur Containing Compounds, Chemical Engineering Communications, 203:4, 435 445, DOI: [10.1080/00986445.2015.1017636](https://doi.org/10.1080/00986445.2015.1017636)
- El Sayed, M. Y., Abdel-Gaber, A. M., & Rahal, H. T. (2019). Safranin—a potential corrosion inhibitor for mild steel in acidic media: a combined experimental and theoretical approach. Journal of Failure Analysis and Prevention, 19(4), 1174-1180.
- [Eucalyptus leaf extract as a eco-friendly corrosion inhibitor for mild steel in sulfuric and phosphoric acid solutions](#) AM Abdel-Gaber, HT Rahal, FT Beqai - International Journal of Industrial Chemistry, 2020
- Al-Moghrabi, R. S., Abdel-Gaber, A. M., & Rahal, H. T. (2018). A comparative study on the inhibitive effect of Crataegus oxyacantha and Prunus avium plant leaf extracts on the corrosion of mild steel in hydrochloric acid solution. *International Journal of Industrial Chemistry*, 9(3), 255-263.

- Abdel-Gaber, A. M., Rahal, H. T., & El-Rifai, M. S. (2021). Green Approach towards Corrosion Inhibition in Hydrochloric Acid Solutions. *Biointerface Res. Appl. Chem.*, 11, 14185-14195.
- El Khatib, L. W., Rahal, H. T., & Abdel-Gaber, A. M. (2020). Synergistic Effect between *Fragaria ananassa* and *Cucurbita pepo* L Leaf Extracts on Mild Steel Corrosion in Hydrochloric Acid Solutions. *Protection of Metals and Physical Chemistry of Surfaces*, 56(5), 1096-1106.
- Al-Moghrabi, R. S., Abdel-Gaber, A. M., & Rahal, H. T. (2019). Corrosion inhibition of mild steel in hydrochloric and nitric acid solutions using willow leaf extract. *Protection of Metals and Physical Chemistry of Surfaces*, 55(3), 603-607.

1. In the experimental part

- The authors did not report if the solutions used for testing were deaerated or naturally aerated
- Why the authors run their study with 1 M HCl ????
- At which temperature???
- The authors should show the potentiodynamic polarization curves
- The authors should do EIS to explain mode of inhibition

1. Poor presentation of data. The authors should provide potentiodynamic polarization curves and EIS and confirm experimental data with theoretical basis

2. All figures and drawings are not clear

3. There are several syntax errors as well as grammatical mistakes. The authors should read the manuscript very carefully and improve the entire manuscript accordingly.

4. Support your discussion with literature

- Kilo, M., Rahal, H. T., El-Dakdouki, M. H., & Abdel-Gaber, A. M. (2021). Study of the corrosion and inhibition mechanism for carbon steel and zinc alloys by an eco-friendly inhibitor in acidic solution. *Chemical Engineering Communications*, 208(12), 1676-1685.
- Rahal, H. T., Abdel-Gaber, A. M., & Awad, R. (2017). Influence of SnO₂ nanoparticles incorporation on the Electrochemical Behaviour of a Superconductor in Sodium Sulphate Solutions. *Int. J. Electrochem. Sci*, 12, 10115-10128.
- Rahal, H. T., Abdel-Gaber, A. M., Awad, R., & Abdel-Naby, B. A. (2018). Influence of nitrogen immersion and NiO nanoparticles on the electrochemical behavior of (Bi, Pb)-2223 superconductor in sodium sulfate solution. *Anti-Corrosion Methods and Materials*.

1. The authors must write a proper mechanism of the corrosion inhibition

2. At the end of the article, you do not offer recommendations or address the implications of your findings