Review of: "Investigation of the Dielectric Behaviour of Propylene Glycol (100) Dispersed With Graphene Nano Powder to Determine the Optimal Conditions Using Response Surface Methodology"

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Potential competing interests: No potential competing interests to declare.

Reviewer comments

Title: Investigation of the Dielectric Behaviour of Propylene Glycol (100) Dispersed with Graphene Nano Powder to Determine the Optimal Conditions Using Response Surface Methodology

The manuscript entitled 'Investigation of the Dielectric Behaviour of Propylene Glycol (100) Dispersed with Graphene Nano Powder to Determine the Optimal Conditions Using Response Surface Methodology' is well presented. The work lacks in novelty and objective. Although the manuscript has to be modified in various aspects using the following comments to improve and make it more appropriate for the current trend. A major revision is required.

General comments

1. The novelty of the manuscript is nowhere written in the manuscript. The authors are requested to highlight the origin of the research and novelty of the work in the introduction section.
2. The objective of the work is not up to the mark. The manuscript aims to investigate the dielectric properties of a nanofluid using the RSM technique. What is the need for the work? Highlight other objectives if any in the introduction part.
3. The manuscript should be proofread for grammatical and typographic errors. All units mentioned in the manuscript should be checked.

Abstract

1. The sentence '*This study used 3-11 mm distance and 2.77-3.13 kV breakdown voltage.' Is not clear* The operating conditions and where they are applied are not mentioned in the abstract.
2. The statements given in the abstract are not giving the complete idea about the work. The authors are requested to improvise the statements.
3. The authors claim that 'Two models are tested: linear and 2FI. Investigating and evaluating these modeling functions' statistical properties is new to the area'. Kindly explain the area and make the sentence clearer.
4. Abbreviations (short forms) should be avoided in the abstract. Mention the full form of the 2FI model for the first time in the abstract.

5. Mode summarized results should be highlighted in the abstract.

Introduction

1. The starting of the introduction is well written. But the road to the problem statement is not presented well in the manuscript. Kindly modify the same.
2. The research gap or identified problem should be stated in detail in the introduction part.
3. The need for statistical analysis and RSM tool is not described in the introduction part. Kindly add the same.
4. The work done in the research should be summarized and highlighted as the last paragraph of the introduction section.
5. I cannot find any literature review section in the introduction. A detailed literature review citing some potential articles and the major inferences obtained which thrust to the present research should be also highlighted in the introduction section.

Materials & Methodology and Experimental Procedure

1. The authors are advised to only write about the materials used, software, and experimental procedure in Section 2: Materials and Methodology. General information about graphene, polyethylene glycol, RSM tool, etc., should be removed and added appropriately in the introduction section.
2. Section 2 and Section 2.1 should be replaced and added suitably in Section 1: Introduction section.
3. Details about the experimental set-up, diagrams, and other methodologies should be clearly given in Section 2 - Materials and Methodology.

Results and Discussion

1. It is stated that '*To get the highest possible viscosity, the best possible model is chosen and analyzed*. Why did the authors choose viscosity as the property? How is viscosity related to the dielectric behavior of the nanofluid?
2. To perform RSM analysis, the sample viscosity of the nanofluids should be measured. How did the authors measure the viscosity of the present fluid?
3. How do the authors claim that the nanomaterial is graphene? The authors should give some characterization results to prove the material is graphene.
4. Give a proper justification for the statement '*increasing the distance leads to a reduction in electrical conductivity*'.
5. Give the comparison of electrical properties of propylene glycol (100) and graphene-dispersed propylene glycol (100).
6. How the authors arrive at a mathematical model that gives the optimum electrical conductivity of the nanofluid?
7. No mathematical model or equation is given in the manuscript. The authors must mention the mathematical relationship in the manuscript.
8. Why did the authors select the mentioned two models for analysis? Justify.