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Notice for the PhD Viva-Voce Examination

Mr Srinivasa D M (Registration Number: 1870096), PhD scholar at the School of Engineering and Technology, CHRIST (Deemed to be University), Bangalore will defend his PhD thesis at the public viva-voce examination on Tuesday, 16 April 2024 at 10.30 am in the CDI Conference Room, III Floor, Block V, School of Engineering and Technology, Bangalore Kengeri Campus, Bengaluru - 560074.

Title of the Thesis	:	**Synthesize of Indigenous Natural Ester Based Liquid Dielectrics and its Performance Evaluation in Transformers**
Discipline	:	**Electrical and Electronics Engineering**
External Examiner (Outside Karnataka)	:	**Dr Savier J S** Principal College of Engineering Sreekariyam Post Trivandrum Kerala- 695016
External Examiner (Within Karnataka)	:	**Dr B Rajesh Kamath** Professor Department of Electrical and Electronics Engineering Sri Siddartha Institute of Technology Tumkur - 572105 Karnataka
Supervisor	:	**Dr Usha Surendra** Professor Department of Electrical and Electronics Engineering School of Engineering and Technology CHRIST (Deemed to be University) Bengaluru - 560074 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 01 April 2024

ABSTRACT

Transformer is generally considered to be the heart of the power system. Transformers are the main equipment in the transmission and distribution network to be monitored for uninterrupted flow of power. The liquid dielectrics play an important role in functioning of transformer. It serves as an effective coolant and also it determines the life of transformer. Thus, the reliability of a power transformer is largely determined by the condition of insulation. The transformer oil is the bi product of petroleum. However, the usage of petroleum oil is running out of demand and there may be a severe shortage of oil exists in future. Also during its use and disposition, transformer oil is highly dangerous to aquatic and human life due to its non-biodegradability and hence it is not environment eco-friendly. This has given scope for new alternative biodegradable dielectric fluids such as natural esters, replacing the traditional mineral oil. These vegetable-oil-based liquids are non-toxic and meet all the requirements for a high temperature insulating liquid. The Partial discharge pulses present in the liquid dielectric leads to breakdown of streamer development and formation of sludge. Hence it is important to analyze the Partial Discharge properties of oils.

The aim of the present work is to investigate suitability of Indigenous Natural Ester based liquid dielectrics as a liquid dielectric coolant and also to analyze the partial discharge phenomena, particularly in transformers. The results obtained are well within the IEC 62770 standards. Results shows that developed indigenous natural ester oil that has better viscosity, breakdown voltage, flash point and partial discharge properties. As a result, developed indigenous oil will be an alternate for mineral oil in high-voltage applications.

Keywords: Transformer, Liquid dielectrics, Antioxidants, Partial discharge.

Publications:

1. **Srinivasa D.M.,** Surendra U., & Pattanshetti V.V. (2020). Investigation of dielectric properties of indigenous blended ester oil for electric system applications. *Advances in Science, Technology and Engineering Systems Journal, 5*(5), 669-673. https://dx.doi.org/10.25046/aj050582 .
2. **Srinivasa D.M.,** & Surendra U. (2023). Investigation of electrical properties of developed indigenous natural ester liquid used as alternate to transformer insulation. *Indonesian Journal of Electrical Engineering and Computer Science, 29*(2), 609-617. https://ijeecs.iaescore.com/index.php/IJEECS/article/view/26698/17008