

CRITERION OF INSULATION PERFORMANCE BY  
USING COMBINATION OF MINERAL OIL AND  
OLIVE OIL IN POWER TRANSFORMER

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## **ABSTRACT**

There are three types of insulation that have been recently used as an insulator for high voltage apparatus. Gas dielectric, liquid dielectric and solid dielectric are the three of them. Dielectric or insulation acts as a cooling agent and prevents the breakdown of transformer which happens due to overheating or overflow of high voltage. There are also many types of transformer and power transformer is one of them. This type of transformer uses liquid insulation as its insulator. As we know the transformer cost us millions and it is a price that we could not afford for constant period of time. So, a lot of research has been done to improve liquid insulation. Up until now, we used petroleum-based mineral oil as insulator. But, we cannot continue to use this type of insulator for long time since it is a non-renewable source. So, this research aims to improve the performance liquid insulator by combining petroleum-based mineral oil with olive oil.

The purpose of using this olive oil is because it is a renewable and sustainable resource. Combining petroleum-based mineral and olive oil have the possibility to improve the performance of liquid insulator. Experiments will be conducted to determine viscosity, breakdown voltage, power factor, ageing time and etc. The expected result will be the improvement in the usage of liquid insulator. As a conclusion, combining the petroleum-based mineral and olive oil have the potential to improve the performance of the liquid insulator looking at the facts that olive oil is unsaturated fatty acid and olive oil are mentioned in the Holy Qur'an in seven occasion showing that it has a lot of advantages that has yet to be discovered.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 OVERVIEW OF STUDY**

The increasing usage of electricity has given a cause to further improve the power system equipment with a high level of reliability and safety degree. As shown in Figure 1.1 the connection of the power system grid starts from power plants going through transmission lines to the distribution lines and reach the end users [2].