Affecting Factors Titanium Oxide of Nanoparticles for the Electrical Effect on Insulation Resistance of the Transformer Oil

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***Abstract*— In most cases, The electrical insulation of the transformer oil will be exposed to different internal problems, such as short circuit , over voltage, over load, over excitation and etcetera. The insulation of transformer will be sever decreased into minimum value. This requires some treatments of oil liquid ,such as refining or replacing the damaged oil with a new, which is a very expensive process. In this paper, the Insulation Resistance (IR) of transformer oil will be enhanced by using nanoparticles NPs. Titanium oxide (TiO2) one of them, which will be used in this experiment. The (NPs) improve the insulation, physical and chemical properties of transformer oil. The breakdown voltage will be tested for pure oil and after the addition (TiO2) according to IEC standard methods. The results of this study indicated that addition of TiO2 in certain quantities of pure oils can be affected the Insulation Resistance (IR) and electrical breakdown voltage. A comparative study was conducted to identify the effects of using nanoparticles in pure transformer oils to ensure their effect on electrical Insulation Resistance (IR). The results are indicated an increasing in the breakdown voltage and the dissipation factor of the transformer oil, thus results using nanoparticles oil higher than pure oil.**

***Keywords*—Nanoparticles (NPs), Insulation Resistance (IR) test, breakdown voltage (BDV) test and Titanium oxide (TiO2).**

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