



A REVIEW OF STUDY AND PERFORMANCE OF PARTIAL DISCHARGE FOR DIFFERENT TYPE OF INSULATION MATERIALS

Khushboo Patareya ¹, Professor Arun Pachori ²

^{*1} Research scholar, Fourth Semester ME (High Voltage Engg.), Jabalpur Engineering College, Jabalpur (M.P) 482011, India

² Associate Professor, Department of Electrical Engineering, Jabalpur Engineering College, Jabalpur (M.P) 482011, India

Abstract:

The insulation should be high quality for power transmission and high voltage application, in this way we are studying about the various type of insulation material such as epoxy resin, vulcanized fibres and polyethylene which are having different capacitance value, the power transmission equipment's has less efficiency due to degradation of insulation material. In this paper, we are studying the partial discharge for the different type of insulation materials.

Keywords: Partial Discharge; Insulation Materials; Properties.

Cite This Article: Khushboo Patareya, and Arun Pachori. (2018). "A REVIEW OF STUDY AND PERFORMANCE OF PARTIAL DISCHARGE FOR DIFFERENT TYPE OF INSULATION MATERIALS." *International Journal of Engineering Technologies and Management Research*, 5(12), 156-159. DOI: 10.5281/zenodo.2544796.

1. Introduction

The insulation materials are having many properties and the capacitance value of epoxy resin ($\epsilon_r=3.4$), vulcanized fibres ($\epsilon_r=2.5$) and polyethylene ($\epsilon_r=2.2$) was used in this study. The properties of insulation material should be better for prevent the breakdown of power transmission equipment, the partial discharge occurs in the insulation and high voltage electrical system. The failures of insulation are induced due to partial discharge in high voltages equipment during high voltage power supply. Various component such as high voltage power supply, high voltage filters, coupling capacitor, detector circuit and test object are used in partial discharge measuring system. The test object are consisting of three capacitors (C_a, C_b, C_c).

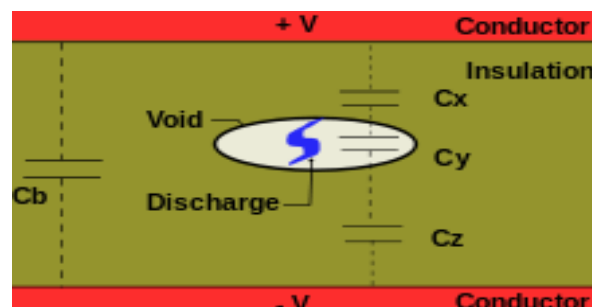


Figure 1: partial discharge in void

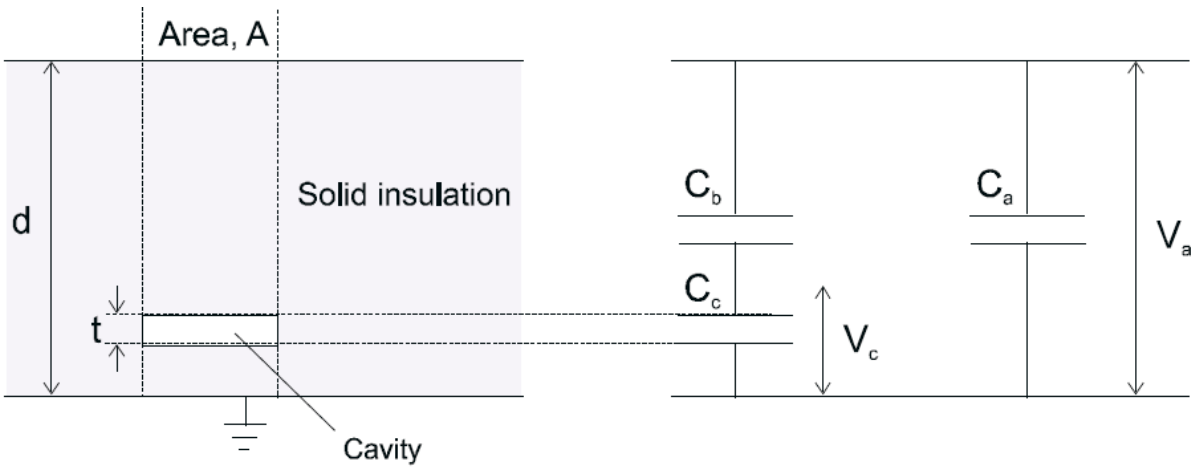


Figure 2: capacitance model in solid insulation with cavity

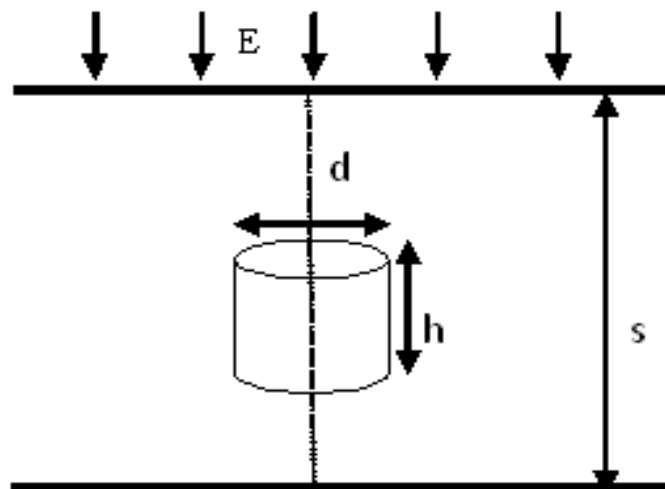


Figure 3: void in solid insulation with axis parallel

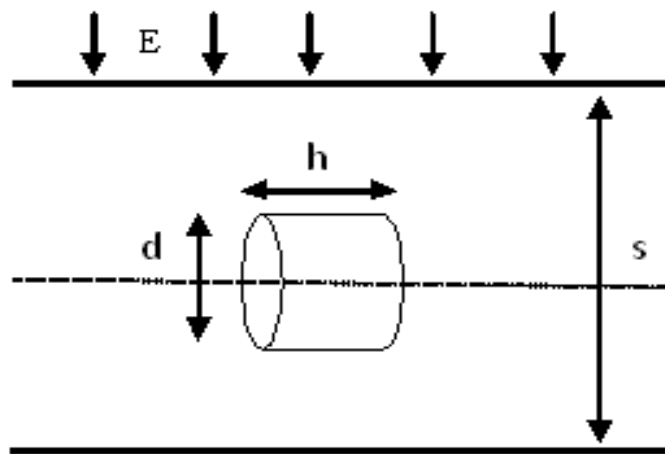


Figure 4: void in solid insulation with axis perpendicular

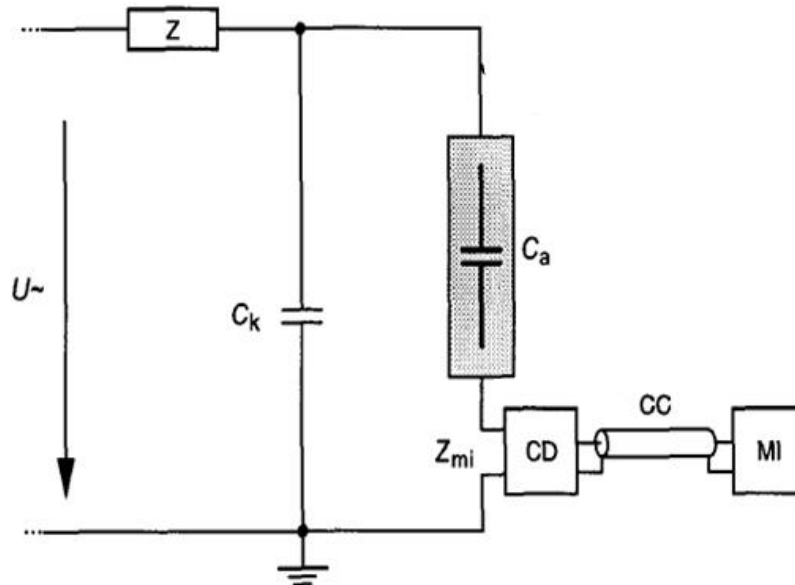


Figure 5: partial discharge measuring circuit

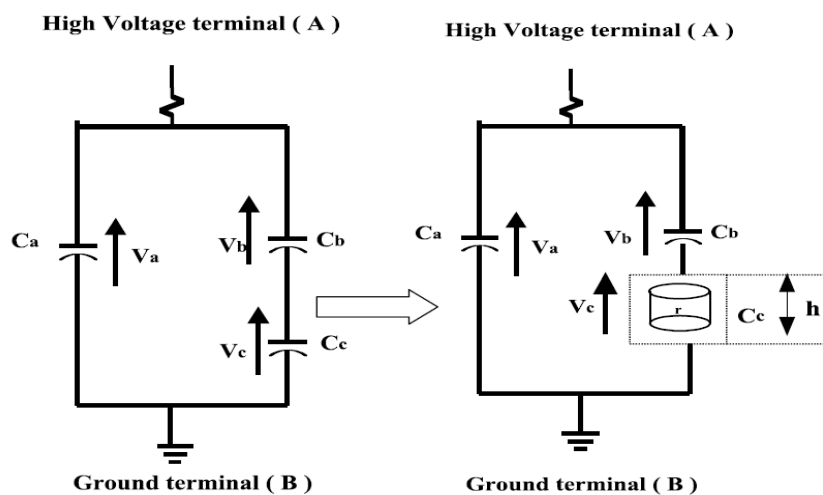


Figure 6: void model in solid dielectric

2. Conclusion

The breakdown of electrical equipment's are occurred due to degradation of insulating material, the partial discharge measurement is very necessary for proper working of electrical equipment. In this way we are study the partial discharge using epoxy resin ($\epsilon_r=3.4$), vulcanized fibres ($\epsilon_r=2.5$) and polyethylene ($\epsilon_r=2.2$) and having different capacitance value.

References

- [1] T. Ijichi, F. Komori, et al., "Effects of surface conductivity on current form for PD pulse in voids," 2001 Annual Report Conference on Electrical Insulation and Dielectric Phenomena, pp.319 -323, 2001.

- [2] Y.H. Cheng, and C.Y. Ren. “Study on model modification and parameter computation of partial discharge simulation in single void”. Journal of Xi’an Jiaotong university, Vol.38, No.8, pp.815-819, 2004.
- [3] Y.H. Cheng, and X.L. Chen. “Simulation Calculation of Partial Discharge in Single Void Using Variable Void Resistance Model”. Journal of Xi’an Jiaotong university, Vol.38, No.10, pp.1018-1021, 2004.