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An Experimental Study on Partial Discharge Characteristics of Polyvinyl Chloride (PVC) Under AC – DC Voltage

Abdul Syakur*, Yanuar Z. Arief**, Zulkurnain A. Malek**, Hussein Ahmad**

* Department of Electrical Engineering Universitas Diponegoro, UNDIP, 50275 Semarang, Indonesia.

** Institute of High Voltage & High Current, Universiti Teknologi Malaysia, UTM, 81310, Johor, Malaysia.

Email: gakusei2003@yahoo.com

Abstract: The partial discharges (PD's) due to artificial void in the sample of Polyvinyl Chloride (PVC) sheet have been investigated in this work. PD may cause the degradation of insulating materials and affect the lifetime of high-voltage apparatuses. Therefore, it is important to understand the correlation between PD inception voltages under various voltage source conditions. An experimental work using sphere ball – plane electrode system and a PVC sheet 0.8 mm was carried out. PD experimental data results such as PD inception voltage PDIV (V_i) and PD current as functions of voltage magnitude were compared for different voltage sources. The experimental results showed that the PD inception voltage under AC and DC voltage sources were not similar. The PD inception voltage under DC voltage source is lower than that for AC voltage source. Other results show that the PD current is a function of voltage magnitude. The PD current tends to increase when the voltage magnitude is increased.

Keywords: Partial Discharge, Polyvinyl Chloride, PD Inception Voltage (PDIV)