Insulation Properties of Rod-Plane Electrode Covered with ATH/SIR Nano-Composite in Dry-Air

Authors : Jae-Yong Sim, Jung-Hun Kwon, Ji-Sung Park, Kee-Joe Lim

Abstract : One of the latest trends for insulation systems to improve the insulation performance is the use of eco-friendly hybrid insulation using compressed dry-air. Despite the excellent insulation performance of sulphurhexafluoride (SF6) gas, its use has been restricted due to the problems with significant global warming potential (GWP). Accordingly, lightning impulse performance of the hybrid insulation system covered with an aluminum trihydrate/silicone rubber (ATH/SIR) nanocomposite was examined in air at atmospheric pressure and in compressed air at pressures between 0.2 and 0.6 MPa. In the experiments, the most common breakdown path took place along the surface of the covered rod. The insulation reliability after several discharges should be guaranteed in hybrid insulation. On the other hand, the surface of the covered rod was carbonized after several discharges. Therefore, nanoscale ATH can be used as a reinforcement of covered dielectrics to inhibit carbonization on the surface of a covered rod. The results were analyzed in terms of the surface resistivity of the cover dielectrics.

Keywords : nanocomposite, hybrid insulation, ATH, dry-air

Conference Title : ICEET 2014 : International Conference on Electrical Engineering and Technology

Conference Location : London, United Kingdom

Conference Dates : August 21-22, 2014