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Influence of Nano-ATH on Electrical Performance of LSR for HVDC Insulation

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Abstract : Many studies have been conducted on DC transmission. Of power apparatus for DC transmission, High Voltage Direct Current (HVDC) cable systems are being evaluated because of the increase in power demand and transmission distance. Therefore, dc insulation characteristics of Liquid Silicone Rubber (LSR), which has various advantages such as short curing time and the ease of maintenance, were investigated to assess its performance as a HVDC insulation material for cable joints. The electrical performance of LSR added to Nano-Aluminum Trihydrate (ATH) was confirmed by measurements of the breakdown strength and electrical conductivity. In addition, field emission scanning electron microscope (FE-SEM) was used as a means of confirmation of nano-filler dispersion state. The LSR nano-composite was prepared by compounding LSR filled nano-sized ATH filler. The DC insulation properties of LSR added to nano-sized ATH fillers were found to be superior to those of the LSR without filler.

Keywords : liquid silicone rubber, nano-composite, HVDC insulation, cable joints
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