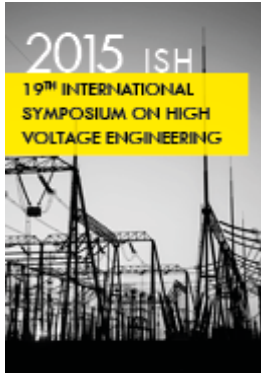

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Title:

Creeping discharge characteristics under non-uniform field on single pulse voltage application in CO₂/N₂ mixtures

Abstracts

N₂, CO₂ and their mixtures as well as SF₆/N₂ mixtures have been interested in the practical application as an insulating medium in place of SF₆. However, the insulation characteristics of those gases under the non-uniform field have not been clarified. Especially, creeping flashover characteristics have not been elucidated. In this work, creeping discharge characteristics in CO₂/N₂ mixtures under steep-front pulse voltage on non-uniform field have been investigated. It is well-known that CO₂ gas is also electronegative gas, but its electronegativity is very weak. In the case of CO₂/N₂ mixed gas, the dependency of gas content on flashover voltage is quite different from that in the case of SF₆/N₂ seen in our previous work, a maximum value of flashover voltage has been observed for 10 to 30% CO₂ admixture into N₂. This behaviour is seen not only in the negative polarity, but also in the positive polarity. This type of dependency is reported only limited gas mixture under uniform field. Moreover, this behaviour strongly depends on the thickness of solid dielectrics on which surface creeping discharges develop. From creeping corona observations, the corona growth at early stage is suppressed for CO₂ mixtures of 10 and 30% compared with that for pure N₂. In 30% CO₂, broad corona emission is appeared widely on the solid dielectrics just like observed in pure N₂. On the contrary, in pure CO₂, creeping corona extension is relatively suppressed due to the electron attachment. Namely, both the effects, field relaxation by accumulated charges and electron attachment by negativity, are active.

More Informations :

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