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Research on the arc of mixture using the confined space

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In order to avoid the random of the discharge paths on the polluted insulators, we make use of the capillary to form the arc in the confined space. In the capillary, the salt grains and kaolin powder are used to replace the composition of the polluted layer respectively. The voltage and the current waves of the arcs are recorded, and the photographs are presented. The experimental results show that the arc in the kaolin powder is a kind of arc including corona in a two-phase mixture (gas and solid), and the arc in the salt grains is also a kind of arc including corona in a two-phase mixture, but also with the process of phase transformation of the salt grains (solid-to-liquid) which results in the corona existing on the peak-value and the descending step of the voltage. The phase transformation of the salt grains in the arc is critical process which will influence the discharge characteristic. These results will contribute to the study of dry band discharges on the polluted insulators.

Author: YE, qizheng (Huazhong University of Science and Technolog)

Co-author: Dr SHAO, Guiwei (High Voltage Department of China Electric Power Research Institute)

Presenter: YE, qizheng (Huazhong University of Science and Technolog)

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