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2P74 - STUDY OF DISSOCIATION CHARACTERISTIC OF SF₆-N₂ MIXTURES UNDER CORONA DISCHARGE WITH PIN-TO-PLATE ELECTRODE

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SF₆/N₂ gas mixtures has the huge potential. However, due to the inevitable insulation defects in high voltage apparatus, partial discharge is caused, and then the mixture is decomposed, which ultimately endangers the safe operation of the equipment. The study on the decomposition of SF₆/N₂ mixtures in corona discharge is of guiding significance to the timely detection of early failure of equipment and the insulation of diagnostic equipment.

In this paper, the defect model of electrode corona discharge was designed, and the experimental platform was set up. The variation of discharge during SF₆/N₂ mixtures decomposition was studied by using impulse current method. By changing the applied voltage, gas pressure, gap distance, water content, and mixing ratio respectively, the effects of these factors on the discharge energy, discharge quantity and decomposition products of SF₆/N₂ mixtures were studied. The experimental results show that the SF₆/N₂ mixtures decomposition produces include NF₃, SOF₂ and SO₂F₂ under the defect of the corona discharge of the pin-to-plate electrode. The production rate of NF₃ is low while the output of SOF₂ is more than SO₂F₂. The production of decomposition products also increases along with the discharge time increasing, the applied voltage increasing, the pin-to-plate electrode gap distance reducing, the SF₆/N₂ gas pressure and the proportion of SF₆ reducing. The ratio and the total yield of SF₆/N₂ mixtures decomposition products can be used as the characteristic parameters to distinguish the spark discharge and corona discharge of the pin-to-plate electrode.

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