

电工理论与新技术

金属化电容器中金属丝温升及断开机理

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摘要: 采用安全膜结构的金属化电容器能防止贯穿性击穿, 从而起到二次保护作用。研究了T型金属化膜的熔丝断开机理、熔丝断开能量与时间的关系以及熔丝断开的机理, 计算了熔丝表面最高温升。实验结果表明: 当熔丝的通流时间大于1.5 ms时, 电流热效应产生的机械力使安全膜熔丝的金属层产生微小裂纹, 当裂纹达到一定长度, 两端发生击穿放电, 金属层因蒸发而断开; 当熔丝中通过较大的电流时, 短时间内(<150 ns)的电流热效应使熔丝金属层发生熔化产生裂纹, 裂纹两端发生击穿放电, 金属层因蒸发而断开。

关键词: 温升 自愈 金属丝 金属化安全膜

Temperature Rise and Blowing out Mechanism of Fuse in Metallized Capacitors

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Abstract: Safety electrode protects metallized capacitors from catastrophic breakdown, which helps the metallized capacitors achieve better self-healing as a role of second protection. The blowing out mechanism of the fuse in T-polypropylene metallized film, the energy for blowing, the relationship between broken-down energy and time, and the highest temperature rise of the fuse was analyzed. The experimental result shows that when the discharge time was more than 1.5μs, small crack emerged in the fuses due to mechanical force on the heated fuse, and the metallized layer would be evaporated as the crack became long enough to generate disruptive discharge. When the discharge time was less than 150ns, small crack emerged in the fuses due to the current heat, and the metallized layer would be evaporated as the crack became long enough to generate disruptive discharge.

Keywords: temperature rise self-healing fuse metallized safety film

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