

Analysis of aging status of silicone rubber insulation material and research progress of its repair Countermeasures

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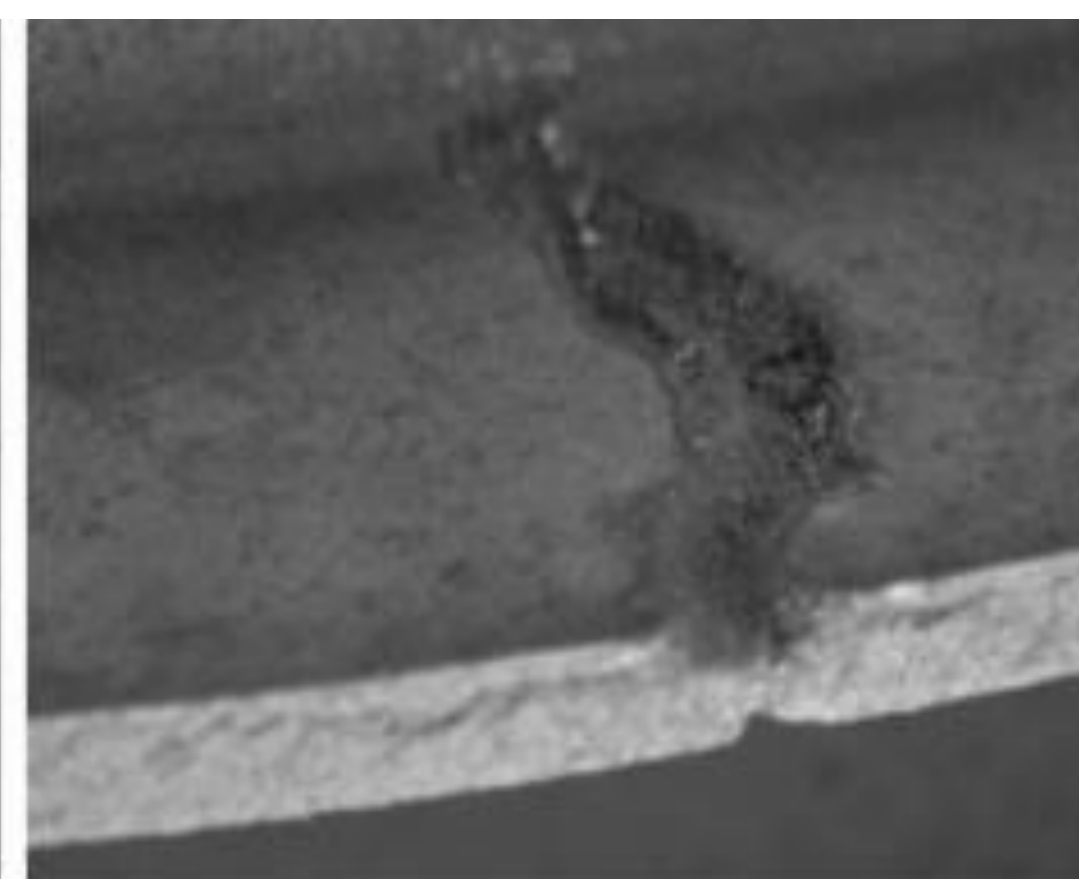
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Introduction

Due to the influence of surface discharge, ultraviolet, rain, snow, wind, sand, pollution and other environmental factors, the application of silicone rubber insulator in China's transmission line system, especially in high voltage and UHV transmission lines, is greatly limited, which increases the pressure and risk of pollution flashover in power system. From the point of view of the existing technology, the characterization and evaluation of composite insulator aging are preliminarily studied. At present, in order to solve the problem of deterioration of mechanical properties and hydrophobicity caused by aging of insulators, we have taken the following measures: manual cleaning, installation of cleaning device, application of RTV coating, spraying of cleaning and repairing agent and modification of composite insulators.



Aging mechanism

Insulation aging scheme

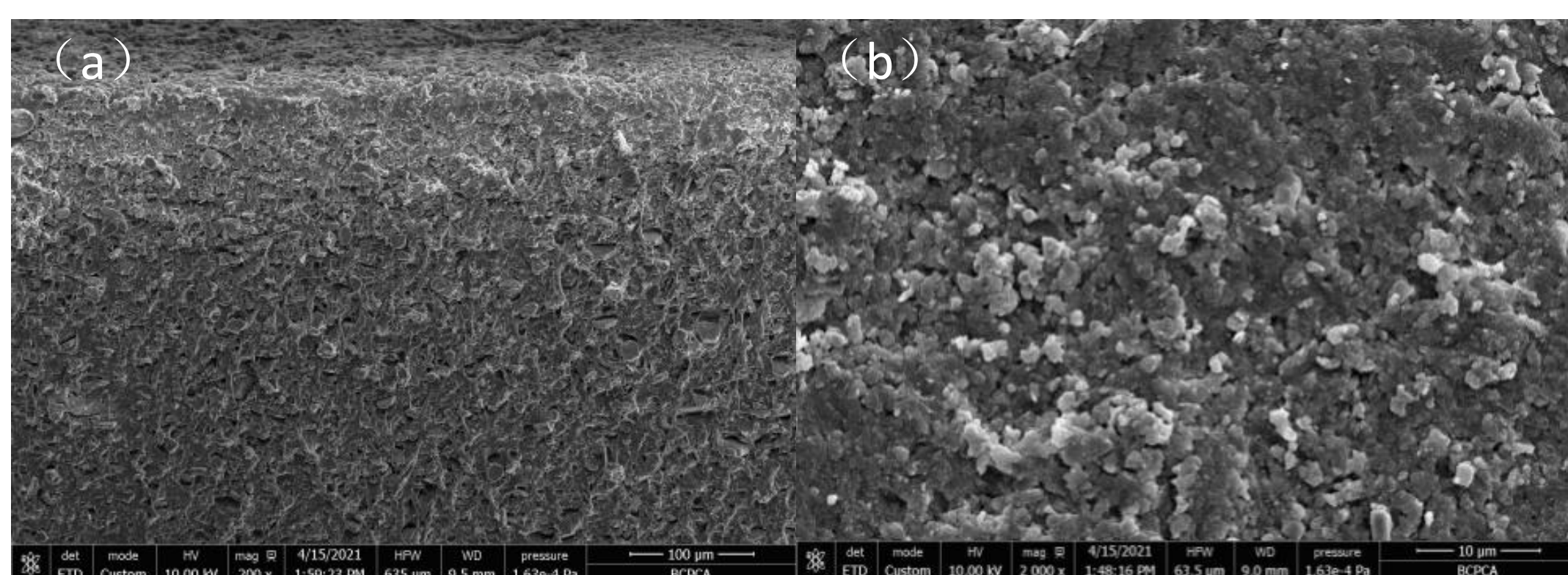


Figure 1. Surface modification of silicone rubber insulator before and after aging
(a. Before aging; b. After aging)

The micro morphology of the surface of the silicone rubber insulator can be observed by SEM, and the magnification of the sample can be between 500 times and 5000 times, as shown in **Figure 1(a)**. It can be seen from **Figure 1(a)** that the surface of the new silicone rubber insulator is relatively flat without obvious holes, cracks and particles; With the increase of the operation time of insulator, as shown in **Figure 1(b)**, it gradually aging, rough surface, more holes and particles, even cracks.

A Manual cleaning

B Installation of automatic cleaning device

C Application of RTV anti -pollution flashover coating

D Spraying cleaning and repairing agent

E Modified composite insulator