

Surface crystallization of a HV insulator glass

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Resumo Atual

It is well known that heterogeneous crystallization arises from impurities sites which act differently for each crystalline phase. Although the crystallization of glasses from soda-lime-silica system have been widely reported in the literature, it is interesting to associate the surface crystallization with previous surface preparation looking for advantages for some technical application. The aim of this work was to investigate the effect of mechanical polishing with CeO₂, Cr₂O₃, Al₂O₃ and SiC #1200 on the crystallization of an insulator glass used in high voltage direct current transmission lines. The crystallization was carried out in a tube furnace during 24, 67 and 96 hours at 650 °C, controlled accurately within $\pm 1^\circ\text{C}$. Three different morphologies were observed by optical and scanning electron microscopy, but not identified by X-ray diffraction, due to the low fraction. Mechanical properties: Vickers hardness, fracture toughness, and nanoindentation hardness and elastic modulus were assessed for these samples. The results show no difference among mechanical properties of the glassy and crystalline phases.

Palavras-Chave:

glass insulators, mechanical properties, crystallization, nanoindentation