

The Effects of Moisture in Metal Oxide on the Mechanical and Electric Properties of Dielectric Elastomer Composites

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Abstract:

Dielectric elastomer (DE) technology are used in several applications for example generator, sensor and actuator. One of the major factors that limits the DE performance is premature electrical breakdown. Compositing is the example that have been reported to increase the breakdown strength. In this study polydimethylsiloxane (PDMS) film will be incorporated with two different fillers which are titanium dioxide (TiO₂) and zinc oxide (ZnO). Both metal oxides will be calcined up to 300°C before they are added to the PDMS elastomer as fillers. The results show that the calcined TiO₂ and ZnO that incorporated in PDMS films show significant increase of breakdown strengths. Meanwhile, the calcined TiO₂ PDMS film give higher breakdown strength as comparison to the calcined ZnO counterpart.

Keywords: Breakdown Strength; Calcination; Dielectric Elastomer; Moisture; PDMS

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