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# Dynamically Cured Poly(vinylidene fluoride)/Epoxidized Natural Rubber

## Blends Filled with Ferroelectric Ceramic Barium Titanate

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### Abstract

Ceramic-polymer composites based on dynamically cured blends of poly(vinylidene fluoride) and epoxidized natural rubber (PVDF/ENR TPVs) with barium titanate (BT) filler were prepared. The main aim was to develop new polymeric materials with high dielectric permittivity and mechanical properties. Two alternative mixing methods were exploited by addition of BT particles before (BDV) or after (ADV) dynamic vulcanization. The ADV method limited the migration of BT into the higher viscosity vulcanized ENR phase. The interfacial localization of BT with the ADV method might make it act as a compatibilizer and improve stress transfer between the two phases. Furthermore, the storage modulus of the composites increased with BT loading. Also, those dynamically cured PVDF/ENR blends with higher PVDF contents had higher permittivities and reduced loss factors. Furthermore, the incorporation of BT particles in PVDF/ENR TPVs produced materials with excellent mechanical and dielectric properties, such that might be applied in energy storage devices.

Keywords: A. Polymer-matrix composites (PMCs); A. Thermoplastic vulcanizates; B. Electrical properties; B. Mechanical properties

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