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ABSTRACT BOOK**

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Possible Mechanism of Permittivity Change of Natural Rubber/Carbon Black Composite During Tensile and Compressive Deformation

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Effects of tensopermittivity¹ and piezopermittivity² in composites based on natural rubber (NR) matrix and carbon black (CB) filler have been observed. These effects have been explained by changing distances among CB particles (aggregates and agglomerates) in the NR matrix during deformation^{1,2}.

In this work, the permittivity change mechanism was proposed based on simultaneous fragmentation and densification process of CB particle agglomerates, and mathematical fitting of our piezo- and tenso- permittivity measurement data was accomplished. The relative permittivity of a NR/CB (6 phr CB) composite during compressive and tensile deformation is shown in Figure 1.

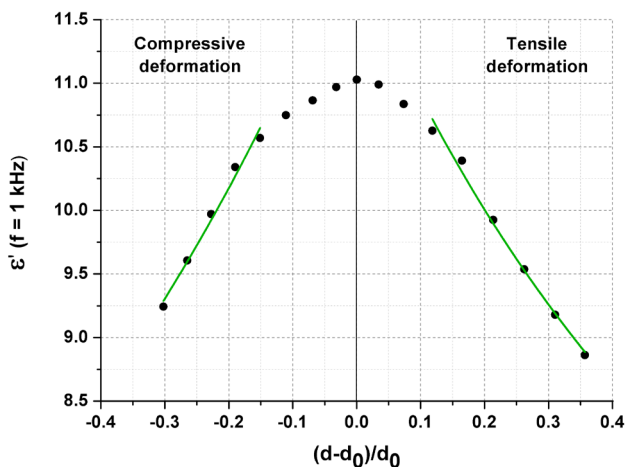


Figure 1. The relative permittivity of the NR/CB (6 phr CB) composite during compressive and tensile deformation.

The continuous lines were obtained by the mathematical nonlinear curve fitting considering the above mentioned mechanism.

References

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- Ozols, K.; Knite, M. *IOP Conf. Series: Materials Science and Engineering* 77 (2015) 012024