

Abstract Submitted
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Effect of Temperature on the Electromechanical Properties of Elastomers RUKSAPONG KUNANURUKSAPONG, Chulalongkorn University — Acrylic elastomers, SAR, and SIS thin sheets are fabricated through solvent casting and tested towards electroactive applications such as artificial muscle and/or MEMS devices. Experiments were carried under the oscillatory shear mode with applied electric field strength varying from 0 to 2 kV/mm. The effect of temperature on the storage and loss modulus (G' and G''), storage modulus sensitivity ($\Delta G'/G'_0$), electrical conductivity, and dielectric permittivity of acrylic elastomers (AR70, AR71, and AR72), SAR and SIS D1112P are studied between 300-360 K. SAR possesses the highest storage modulus sensitivity, 104%, whereas AR72 has the lowest storage modulus sensitivity of about 21.5% at $E = 2$ kV/mm. AR71 has the highest dielectric permittivity (ϵ') of 39.31 pF/m, whereas SIS D1112P has the lowest dielectric permittivity of about 20.74 pF/m. The electrical permittivities of the elastomers increase with increasing temperature. There is a correlation between the storage modulus sensitivity of the elastomers and their dielectric constants.

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