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## Electromechanical response of plasticized poly (lactic acid)/graphene composites as electro-responsive materials

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The electromechanical behaviors of plasticized poly(lactic acid) composites embedded with graphene nanoplatelet were investigated under the effects of graphene concentration and electric field strength. The composites were prepared by solvent casting method. All composites possessed good recoverability during the temporal response experiment under applied electric field. The highest storage modulus sensitivity ( $\Delta G'/G'0$ ) belonged to the 0.1% v/v MG/PLA/DBP composite which provided the value of 1.88 at the electric field strength of 1.5 kV/mm. At the graphene concentration of 1.0% v/v, the storage modulus response ( $\Delta G'$ ) became negative definite, where the storage modulus under electric field ( $G'$ ) was lower than the  $G'0$  value. The negative  $\Delta G'$  under electric field at room temperature has not been previously reported for any electrostrictive materials. Moreover, the pristine PLA/DBP showed the highest deflection distance and dielectrophoresis force relative to the composites at the electric field strength of 550 V/mm, but the deflection distance of the composites decreased with graphene concentration.

### Biography

Natlita Thummarungsan had pursued her BSc and MS in Industrial Chemistry from Chiang Mai University. Presently, she is a PhD student at the Petroleum and Petrochemical College, Chulalongkorn University, Bangkok. Her field of interests are conductive and electroactive polymers, actuators, electromechanical properties, viscoelastic properties, dielectric properties and biopolymers.

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