

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Reducing Dielectric Loss by PVDF-CTFE Graft Copolymers¹

JING WANG, ZHONGZHE YUAN, FANGXIAO GUAN, STEVEN BOGGS, LEI ZHU, Institute of Material Science and Department of Chemical, Materials and Biomolecular Engineering, University of Connecticut, Storrs, CT 06269-3136 — Polymer film capacitors with high energy density and low loss are very attractive in potential applications. Maintaining the high dielectric breakdown strength in high dielectric constant films with a low loss will also be a challenge. Poly(vinylidene fluoride) (PVDF) and its copolymers are well-known ferroelectric polymers that exhibit excellent electromechanical properties as candidates for high-performance, high-energy-density capacitor. However, the dielectric loss of commercially extruded PVDF films is high (0.02). In our work, lower dielectric loss polystyrene (PS) were introduced to improve PVDF dielectric properties. PVDF-CTFE-g-PS graft copolymers were synthesized via the “graft from” process. The quality of films from graft polymer was improved, resulting high energy density and low loss. A series of graft polymers with different electric properties were prepared, since the breakdown strength and dielectric loss of PVDF were influenced by the crystallinities and crystal sizes.

¹This work was supported by ONR Grant N00014-05-1-0338.

Institute of Material Science and Department of Chemical, Materials and Biomolecular Engineering, University of Connecticut

Date submitted: 27 Nov 2007

Electronic form version 1.4