Development of Piezoelectric Nonwoven Polymer Composites Fibers

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Piezoelectric materials generate an electric current when mechanical stress is applied. PVDF is a thermoplastic fluoropolymer with piezoelectric properties, allowing it to be used in small scale energy harvesting applications. The development of polymer composites was expected to generate a synergistic effect in the piezoelectric properties leading to effective, flexible, and affordable piezoelectric materials. Polypyrrole was used to reinforce the effects of PVDF to develop nonwoven fiber mats with enhanced piezoelectric response. The conjugated polymers were added either as coatings to the fibers mats or mixed within the polymeric fibers. Overall, the charge and discharge rates of the fibers were faster, and the fibers were more conductive after coating with Polypyrrole.

Awards Won: