

Abstract Submitted
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Fluoropolymer and Aluminum Piezoelectric Reactives¹ ROBERT JANESHESKI, STEVEN SON, LORI GROVEN, Purdue University — The ability to sensitize a nanoaluminum/piezoelectric polymer composite has been studied using two fluoropolymer systems (THV220A and FC-2175). Fluoropolymers were chosen based on the presence of vinylidene fluoride (VDF) that is known to exhibit piezoelectric properties in certain phases. Reactive composite samples of the nanoaluminum/polymer were made into thin sheets and their ability to store energy and exhibit piezoelectric properties was measured. Also, initial drop weight impact tests were performed on the samples and results showed the piezoelectric energetic composites failed to ignite at a given impact energy. However, when a DC voltage was applied to the sample, the materials ignited at the previous impact energy indicating that the reactive composites may have been sensitized by the stored charge. The application of a DC voltage may also have an effect on the piezoelectric properties of the inorganic energetic composites. Further work is planned to investigate what parameters are inducing the sensitization of the material. A better understanding could lead to applications where switching or changing the sensitization of an energetic material is beneficial.

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