# S2.2.2 and PP6 - *Impact of Storage Methods on Charge Decay of PVDF Fibers*

Harshal Gade[1]
[1]The University of Akron

Electrospun nanofibers in the form of electrets can be used in various applications. Electrets have electrical charge which neutralizes or decays over a period of time. Many applications would require the electrets to preserve their electrical charge in order to be reused again and again. As-spun and polarized PVDF nanofibers of one constant basis weight (20g/m2) and one surface area (4 x 4 cm2) were stored in various storage methods like covered by aluminum foil, various storage methods such as plastic bags and static shielding bags, exposed to light and darkness, various temperatures and humidities. All samples were run through the Faraday bucket once a week for surface charge measurements. Some samples stored under the harshest conditions were run through FTIR once in two weeks to account for changes in beta-phase content. It was observed that various storage methods affected the surface charge decay in a different manner. The polar samples retained charge for more time than non-polar samples in most storage methods. Beta-phase did not change significantly in all storage methods. Charge decay was fastest when stored in conditions with the lowest temperature and humidity. It was found that the surface charge decay was only due to the dissipation of free ions and no changes in beta-phase content were observed with time under any storage method. Electrospun nanofibers in the form of electrets can

be used in various applications. Electrets have an electrical charge which neutralizes or decays over a period of time. Many applications would require the electrets to preserve their electrical charge in order to be reused again and again. As-spun and polarized PVDF nanofibers of one constant basis weight (20g/m2) and one surface area (4 x 4 cm2) were stored in various storage methods like covered by aluminum foil, various storage methods such as plastic bags and static shielding bags, exposed to light and darkness, various temperatures and humidities. All samples were run through the Faraday bucket once in a week for surface charge measurements. Some samples stored under the harshest conditions were run through FTIR once in two weeks to account for changes in beta-phase content. It was observed that various storage methods affected the surface charge decay in a different manner. The polar samples retained charge for more time than non-polar samples in most storage methods. Beta-phase did not change significantly in all storage methods. Charge decay was fastest when stored in conditions with the lowest temperature and humidity. It was found that the surface charge decay was only due to the dissipation of free ions and no changes in beta-phase content were observed with time under any storage method.

## Harshal Gade

Harshal Gade graduated Ph.D. student from Dr. George Chase's lab at the University of Akron. His research interests involve electrospinning of nanofibers, material characterization, and various filtrations and separations.

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