

**Aligned Nanofibers of PVDF and their Applications**

**Abstract**

The electrospinning of PVDF (Polyvinylidene Difluoride) has been used to create a group of aligned PVDF fibers between two separate parallel electrodes at the landing site. Since PVDF has piezoelectric properties, energy can be harvested from mechanical motion. The modification of the aligned fibers is made as follows: one side of the gap between two electrodes is slightly wider than that at the other side. This will result in a group of aligned fibers with gradually different fiber lengths. One application of these aligned fibers with gradually different lengths is possibly a “spectral” sensor. For example, we consider that we can use this device as a chemical detector. Without molecule attachment, the characteristic oscillation frequency of each group of fibers with a specific fiber length is unique. If the device is exposed to a chemical vapor, the oscillation frequency of each group is modulated by the attached molecular mass, which is quantized by the molecular weight. Each group of fibers gives us the molecular mass attached on the fibers. Therefore, we will have more accurate mass change by analyzing all groups of frequency changes. In this case, we may be able to calculate the molecular weight by analyzing possible mass changes in the quantized mass change distribution. In other words, we may have a new kind of mass spectrometer.

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