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Electrospun tin oxide/poly(3-hexylthiophene) nanofiber p-n diodes[1] NICHOLAS PINTO, University of Puerto Rico - Humacao — Electrospinning is a simple technique used to prepare nanofibers of various materials, organic and inorganic. Some advantages of this method is that the nanofibers are orders of magnitude longer than that obtained via conventional means and it is easy to isolate individual nanofibers. We have used this technique to make nanoribbons of n-doped tin oxide (SnO_2) and to make nanofibers of p-doped regio-regular poly(3hexylthiophene) (P3HT) in air and within seconds. Several $p-n$ junction nanodiodes were fabricated by crossing individual nanofibers of P3HT with individual nanoribbons of SnO_2 during the electrospinning process and electrically characterized them at room temperature. The SnO_2 nanoribbons were fabricated first by electrospinning a precursor of SnO_2 and then sintering them at 700 C to convert it to SnO_2 before crossing them with P3HT nanofibers. The devices show clear evidence of rectification in air and in vacuum with a turn-on voltage of $\sim$0.4 V and with rectification ratios $\sim$10. Exposure of the diode to UV light increases the on-state current, while removing the light restores the device to its original state making it suitable as a reusable UV light sensor as well.

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