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Tunable Schottky diodes fabricated from electrospun crossed SnO_2/PEDOT-PSSA nanoribbons[1]

KATHERINE CARRASQUILLO, NICHOLAS PINTO, University of Puerto Rico-Humacao — Hardware in most solid state devices contains at least one interface between a p-type and an n-type semiconductor. Such hetero-junctions are typically fabricated from all inorganic Si based materials. In the past two decades however, devices fabricated from organic-inorganic semiconductors that are not Si based, or from all organic semiconductors have been the focus of much research. Semiconducting n-doped metal oxides are also attractive for use in devices and of particular interest is tin oxide (SnO_2) as it is stable in air and is optically transparent with a band gap of $\sim$3.4 eV. The p-doped conducting polymer PEDOT-PSSA is also stable in air and is widely used in flexible devices. We shall report on the electrospinning technique to fabricate in air Schottky diodes, by simply crossing n-doped SnO_2 and p-doped PEDOT-PSSA nanoribbons. The device parameters could be tuned by a back gate bias and by shining UV light. The diode parameters were calculated using the standard thermionic emission model of a Schottky and was tested as a half wave rectifier.

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