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Gas sensing using the microwave conductivity of conducting polymer nanofiber thin films. ALEXEY KOVALEV, LINTAO CAI, THERESA MAYER, Pennsylvania State University, University Park, PA, 16802. — There are a variety of chemoresistive sensors based on conducting polymer thin films, and studies of conducting polymer nanofiber thin films and single nanofibers sensors are an active area of research because of their enhanced sensitivity. Traditional chemoresistive sensors monitor a change in DC resistance that arises when a low concentration of a chemical vapor is present. In this talk, we will discuss the use of conducting polymer nanofiber thin films as gas sensors that operate in the microwave frequency range. Polyaniline nanofiber films that were 1 - 10 μm thick were characterized measuring DC conductivity (four-point) and microwave conductivity in the range of 4 - 8 GHz. We found a direct correlation between changes in the DC and microwave conductivity during exposure to ammonia and hydrochloric acid at concentrations of 10 - 1000 ppm. These films show a significant response over this range of concentrations, thus opening the possibility of using conducting polymers thin films as remote wireless gas sensors.

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