Abstract Submitted
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Electrical response of monolayer MoS2 to vapors of aliphatic alcohols[1] PABLO SEPULVEDA, IDALIA RAMOS, University of Puerto Rico-Humacao, CARL NAYLOR, A.T. CHARLIE JOHNSON, University of Pennsylvania, NICHOLAS PINTO, University of Puerto Rico-Humacao — Monolayer MoS2 crystals were used to sense vapors of Methanol, Ethanol and 1-Propanol. Due to the large surface area, these sensors are expected to show rapid response and recovery times. The current through the sensor was monitored as a function of time with a constant applied voltage. This current decreased in the presence of the sensing gas and recovered upon its removal. Our results show that the response time gets longer as the size of the alcohol increases, but the recovery time stays approximately the same (˜20s) regardless of the size of the alcohol. The sensitivity was also seen to decrease as the size of the alcohol increased. These observations could be associated with the slower diffusion of the larger alcohol molecules into the MoS2 crystal. The sensors are also fairly robust since the same sensor was used in all of the measurements after annealing in air at 70C for 10 minutes. Additional sensing measurements as a function of gas concentration will also be presented.

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