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Nanopores in suspended WS_2 membranes for DNA sequencing GOPINATH DANDA, Department of Electrical and Systems Engineering, University of Pennsylvania, PAUL MASIH DAS, YUNG-CHIEN CHOU, JEROME MLACK, CARL NAYLOR, Department of Physics and Astronomy, University of Pennsylvania, NESTOR PEREA-LOPEZ, ZHONG LIN, Department of Physics, The Pennsylvania State University, LAURA BETH FULTON, Department of Mechanical Engineering, University of Pittsburgh, MAURICIO TERRONES, Department of Physics, The Pennsylvania State University, A. T. CHARLIE JOHNSON, MARIJA DRNDIC, Department of Physics and Astronomy, University of Pennsylvania — Recent advances in solid-state nanopore sensor systems for DNA detection and analysis have been supported by using increasingly thinner materials to the point of utilizing atomically thin two-dimensional materials such as graphene and MoS_2. However, these materials still have issues with pore wettability and signal-to-noise ratios displayed in DNA translocation measurements. Recently, the fabrication and operation of nanopores in MoS_2 have been demonstrated, but the wetting properties and signal-to-noise ratios of transition metal dichalcogenides are yet to be understood and further improved. Here we fabricate suspended WS_2 nanopore devices with sub-10 nm pore diameters using a novel nanomaterial transfer method and TEM nanosculpting to study and better understand nanopore wetting properties and performance in DNA translocation measurements.

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