

Abstract Submitted
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Dynamics of Bulk vs. Nanoscale WS₂: Local Strain and Charging Effects¹ J. L. MUSFELDT, S. BROWN, R. D. LUTTRELL, J. CAO, University of Tennessee, Knoxville, R. ROSENTSVEIG, R. TENNE, Weizmann Institute of Science, Israel — We measured the infrared vibrational properties of bulk and nanoparticle WS₂ in order to investigate the structure- property relations in these novel materials. In addition to the symmetry-breaking effects of local strain, nanoparticle curvature modifies the local charging environment of the bulk material. Performing a charge analysis on the *xy*-polarized E_{1u} vibrational mode, we find an approximate 1.5:1 intralayer charge difference between the layered 2H material and inorganic fullerene-like (IF) nanoparticles. This effective charge difference may impact the solid-state lubrication properties of nanoscale metal dichalcogenides.

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Janice L. Musfeldt
University of Tennessee, Knoxville

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