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Spatially-Resolved Photoluminescence Mapping of Single CdS Nanosheets[1] M. FICKENSHER, T.B. HOANG, L.V. TITOVA, A. MISHRA, L.M. SMITH, H.E. JACKSON, University of Cincinnati, J.M. YARRISON-RICE, Miami University, H. RHO, K.-Y. LEE, Chonbuk National University, Y.-J. CHOI, K.J. CHOI, J.-G. PARK, KIST — We present results of spatially-resolved low temperature photoluminescence of single 5 micron wide CdS nanosheets. The sheets, grown by pulsed laser deposition using vapor-phase transport, are uniform in size and shape and exhibit a hexagonal wurtzite structure. The orientation of the c-axis determined by PL polarization analysis and HR TEM varies from sheet to sheet. The spatially-resolved PL reveals spectral variation across the sheet, with A-like excitons at the edges showing a spectral peak at 2.547eV, and B like excitons at the center showing a peak at 2.563eV. Exciton lifetimes of $\sim$200 ps are observed, which are significantly longer than CdS nanowires of identical diameter, but shorter than measured in bulk CdS.

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