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Manipulation of Dopants in a Two Dimensional Matrix¹ TIMO-THY KIDD, LAURA STRAUSS, POLINA SKIRTACHENKO, DUSTIN KLEIN, University of Northern Iowa — The layered dichalcogenides can be used as a matrix for incorporating and manipulating dopants in dimensionally constrained manner. The crystal structure of the dichalcogenides is formed of two-dimensional strongly bound layers separated by a van der Waals gap. Dopants can be incorporated between the layers as intercalants through a variety of methods to form a semi-ordered phase. These intercalants have a strong impact on the electronic and magnetic properties of the overall system and can be used to tune or enhance novel phase transitions found in the pure parent compounds. Herein, we discuss how one can manipulate the arrangement of dopants using self-assembled and top-down methods to yield a high level of control over the local electronic and magnetic structure of these materials.

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