Spin ordering in an intercalated magnetic bilayer

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Two-dimensional magnetic materials are considered as promising candidates for developing next-generation spintronic devices by providing the possibility of scaling down to nanometers. However, a low Curie temperature is a crucial problem for practical applications, being intimately related to weak interlayer exchange coupling. We recently reported a chemical way of intercalation to raise the Curie temperature dramatically [1].

The Heisenberg model of istropinc spins impedes long-range ordering in a 2D lattice above 0 K according to the Mermin-Wagner theorem. 2D magnet at finite temperature has been enabled by presence of spin gap like magnetic anisotropy. It is also possible to introduce the spin gap through interlayer exchanging coupling via magnetic atoms intercalated as in our study. Here we study thermodynamic behavior of spins across the Curie temperature with and without intercalation.

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[1] S. Mishra, I. K. Park , S. Javaid, S. H. Shin, and G. Lee, ChemRxiv. (2024); doi:10.26434/chemrxiv-2024-2p6x0