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van der Waals layered materials towards room-temperature magnetic semiconductors

The ferromagnetic state in van der Waals two-dimensional (2D) materials has been reported recently in the monolayer limit. Intrinsic CrI3 and CrGeTe3 semiconductors reveal ferromagnetism but the Tc is still low below 60K. In contrast, monolayer VSe2 is ferromagnetic metal with Tc above room temperature but incapable of controlling its carrier density. Moreover, the long-range ferromagnetic order in doped diluted chalcogenide semiconductors has not been demonstrated at room temperature. The key research target is to realize the long-range order ferromagnetism, Tc over room temperature, and semiconductor with gate tunability. Here, we unambiguously observe a ferromagnetic hysteresis loop together with magnetic domains above room temperature in diluted V-doped WSe2, while maintaining the semiconducting characteristic of WSe2 with a high on/off current ratio of five orders of magnitude.

References

[1] Authors, Journal, Issue (Year) page (Arial Narrow 11) Indicate references with sequential numbers within [square brackets].
[2] Authors, Journal, Issue (Year) page (Arial Narrow 11)
[3] Authors, Journal, Issue (Year) page (Arial Narrow 11)
[4] Authors, Journal, Issue (Year) page (Arial Narrow 11)

Figures

Figure 1: Insert caption to place caption below figure (Arial Narrow 11)