

Fabrication of Transition Metal Dichalcogenides Nanoscrolls

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Abstract

Atomically thin transition metal dichalcogenides flakes were believed capable to scroll into nanoscrolls with distinct properties. However, limited by mechanical strength and chemical stability, production of high-quality transition metal dichalcogenides nanoscrolls remain challenging. Here, we demonstrated high-quality nanoscrolls made from chemical vapour deposition-grown transition metal dichalcogenides flakes. Based on the internal open topology, nanoscrolls hybridized with a variety of functional materials have been fabricated, which is expected to confer transition metal dichalcogenides nanoscrolls with additional properties and functions attractive for potential application.

References

[1] Manish Chhowalla, Hyeon Suk Shin, Goki Eda, Lain-Jong Li, Kian Ping Loh & Hua Zhang. *Nat. Chem.* 5 (2013), 263–275.

Figures

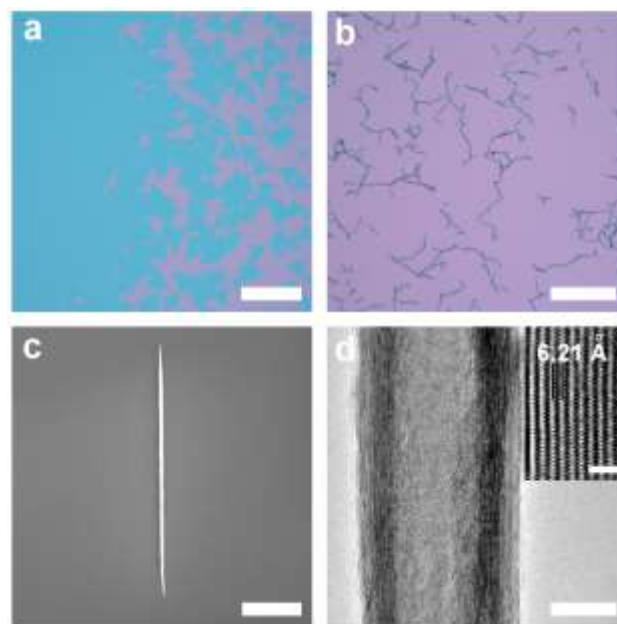


Figure 1: a, Optical image of CVD-grown MoS₂ monolayer flakes on a SiO₂/Si substrate. b, Optical image of MoS₂ nanoscrolls on a SiO₂/Si substrate. c, SEM images of MoS₂ nanoscrolls. d, TEM images of MoS₂ nanoscrolls. Inset: High-magnification images of sidewalls of MoS₂ nanoscrolls. (Scale bars, 500 μm in a, 100 μm in b, 5 μm in c and 2 nm for the inset).