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TMDCs Stacked Layers by Chemical Approach

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Since the isolation of graphene from graphite, tremendous efforts have been directed to the fabrication of heterostructures based on other two-dimensional (2D) materials.[1] In this scenario, the large family of transition metal dichalcogenides (TMDCs), whose members meet the general formula MX_2 (where M represents a transition metal, and X stands for a chalcogenide, such as S, Se or Te), deserves special attention.[2] In this work, we have synthesized a new composite based on chemically exfoliated MoS_2 flakes and a tungsten-based cluster $[W_3S_4(tu)_8(H_2O)]^{4+}$[3] (tu = thiourea) that permits to obtain WS_2/MoS_2 stacked layers via controlled calcination. This represents an easy process for large scale production of stacked layers while keeping close adhesion between the 2D units (Figure 1).

References

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Figures

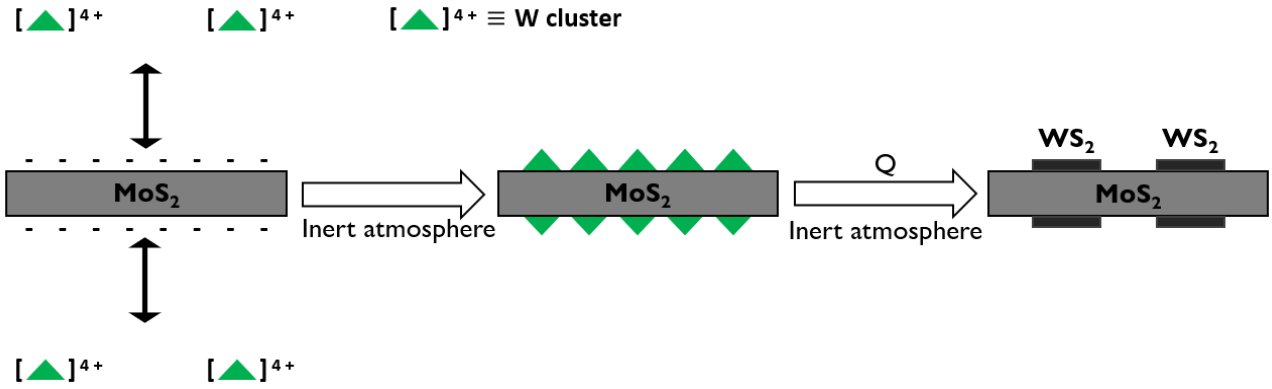

Figure 1: Artistic representation of the synthesis of WS_2/MoS_2 stacked layers using MoS_2 flakes functionalized with the tungsten-containing cluster as a precursor.