Quantum emitters in van der Waals *a*-MoO_3

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Quantum emitters in solid-state materials are highly promising building blocks for quantum information processing and communication science.[1,2] Recently, single-photon emission from van der Waals materials has been reported in transition metal dichalcogenides and hexagonal boron nitride, exhibiting the potential to realize photonic quantum technologies in two-dimensional materials.[3,4] Here, we report the observation of single-photon generation from exfoliated and thermally annealed single crystals of van der Waals *a*-MoO_3. The second-order correlation function measurement displays a clear signature of photon antibunching and the single emitter luminescence intensity is bright and stable under laser excitation. Moreover, the zero-phonon lines of these emitters are distributed in a spectrally narrow energy range. The theoretical calculation suggests that oxygen vacancy defects are a possible candidate for the observed emitters. Together with high brightness and photostability, quantum emitters in *a*-MoO_3 provide a new avenue to realize photon-based quantum information science in van der Waals materials.

References

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Figures

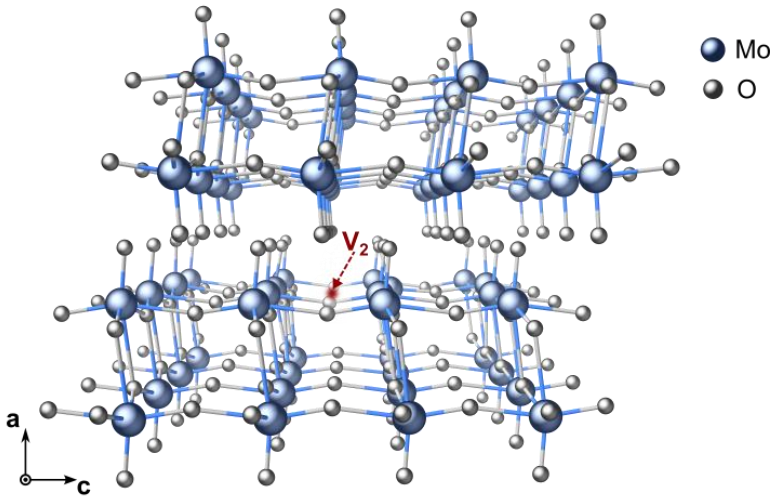

Figure 1: One possible defect center for the single photon emission