Supplementary Material

A mixed valence state Mo-base metal-organic framework from photo activation as surface-enhanced Raman scattering substrate

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Figure

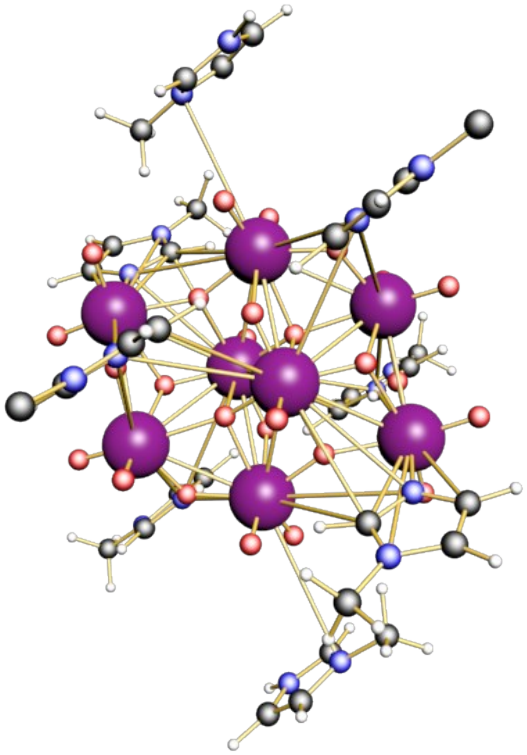

Fig. S1 Schematic of the crystal structures for Mo-MOF[1].

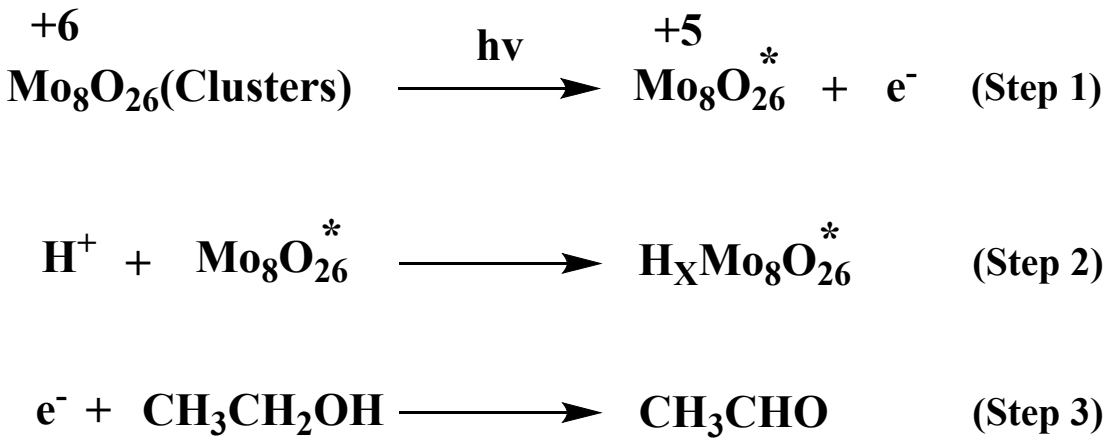

Fig. S2 The probable process for the formation of mixed valence state UV Mo-MOF.

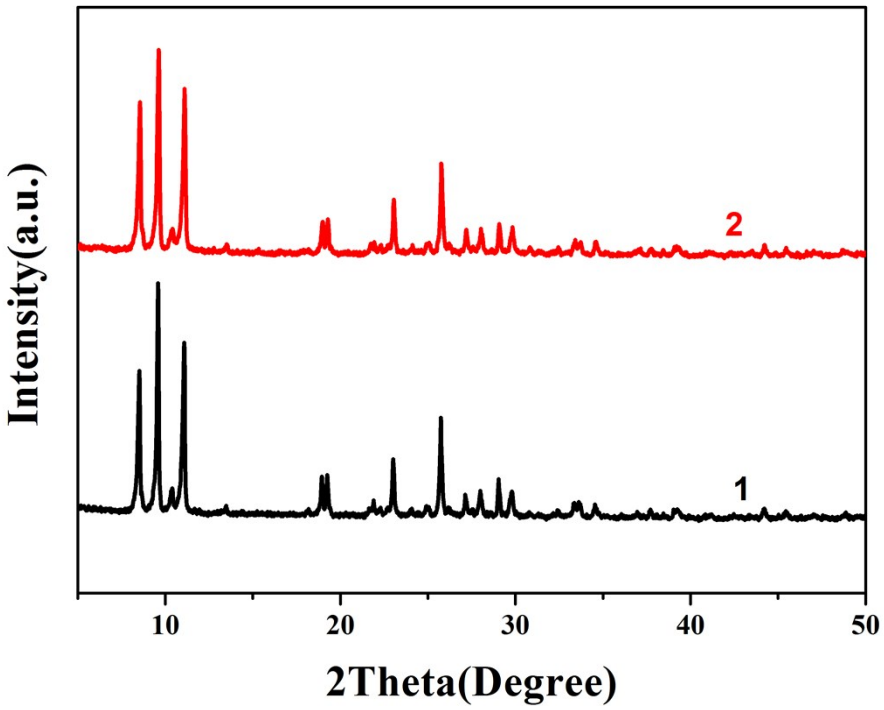

Fig. S3 XRD spectra of Mo-MOF (1) and mixed valence state UV Mo-MOF (2).

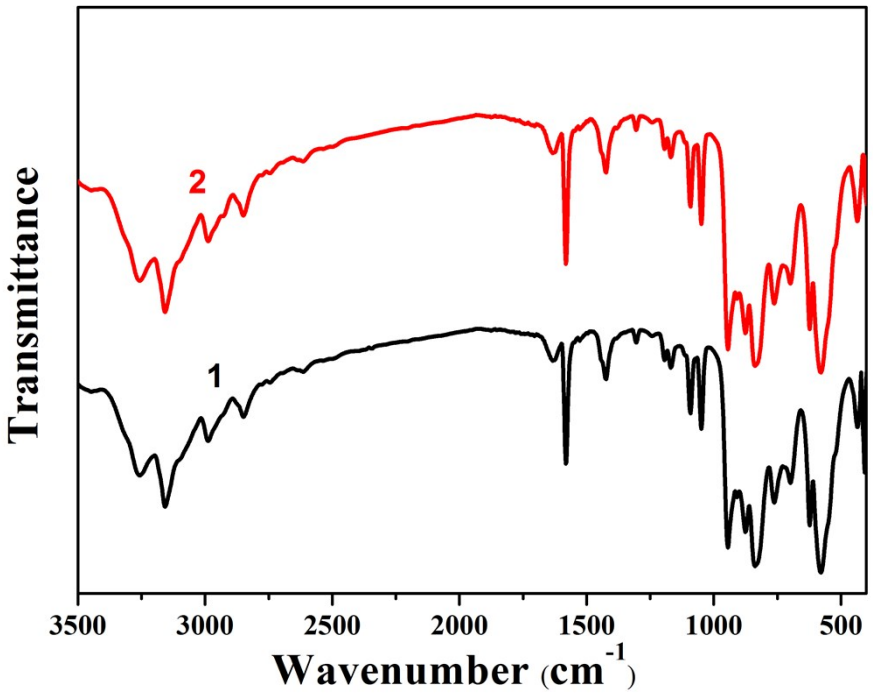

Fig. S4 FT-IR spectra of Mo-MOF (1) and mixed valence state UV Mo-MOF (2).

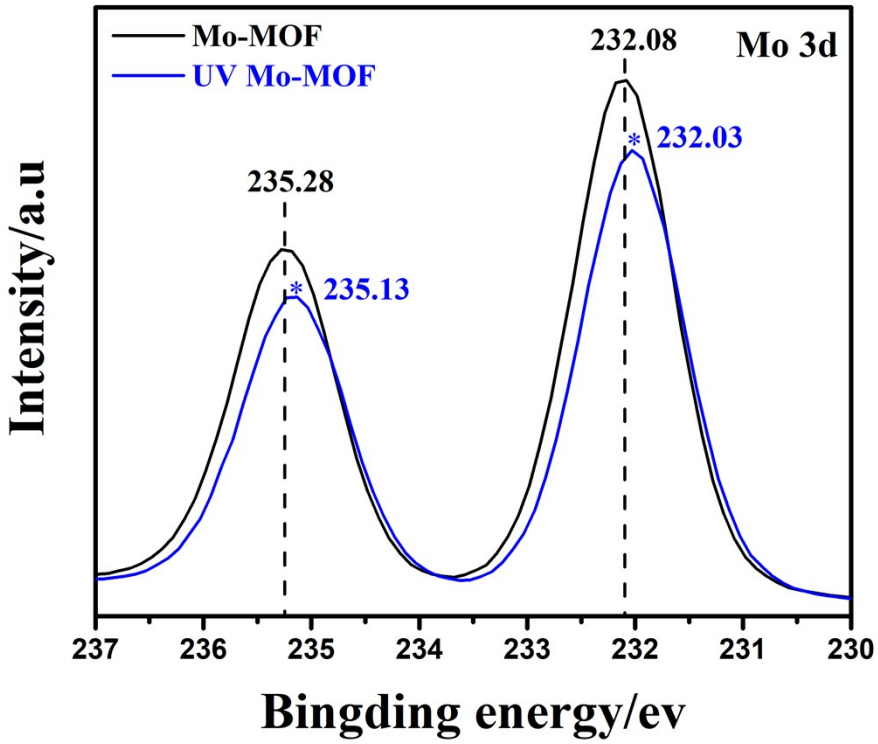

Fig. S5 High resolution XPS of the Mo 3d of Mo-MOF and mixed valence state UV Mo-MOF.

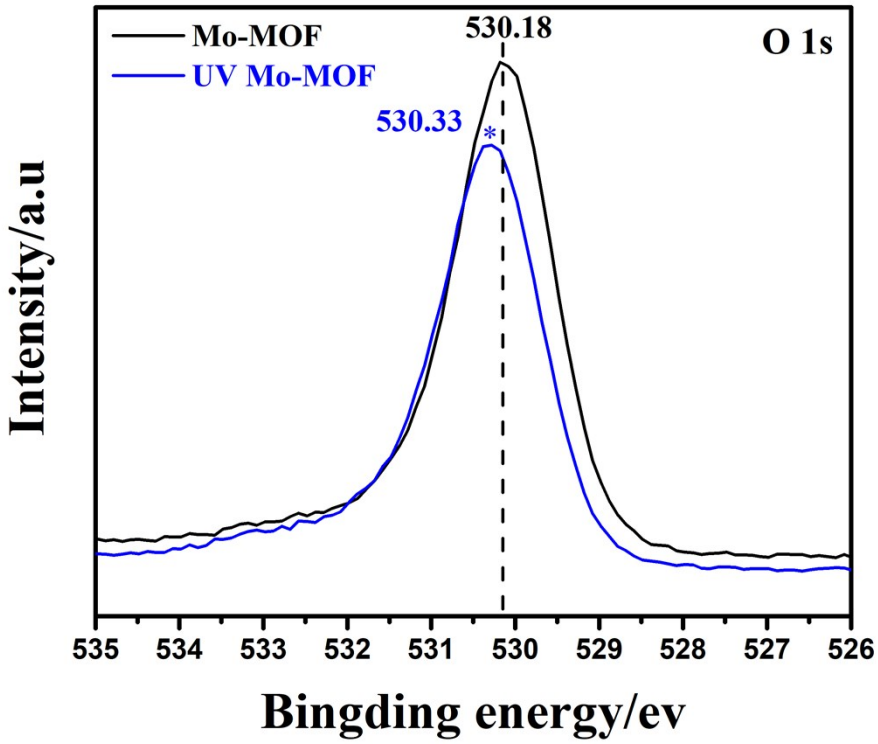

Fig. S6 High resolution XPS of the O 1s of Mo-MOF and mixed valence state UV Mo-MOF.

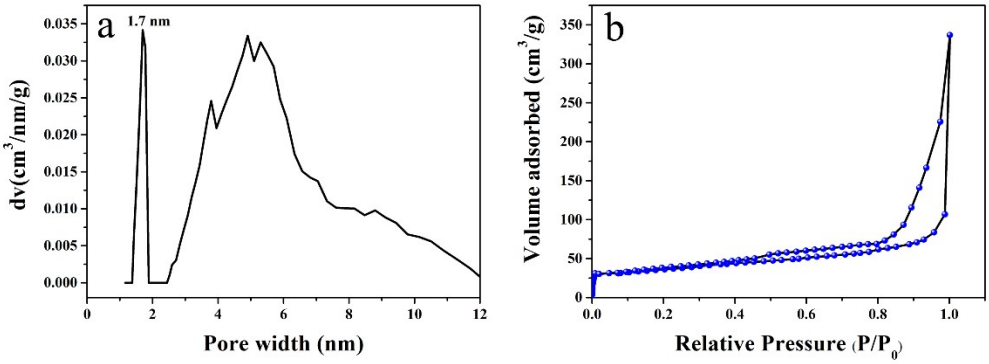

Fig. S7 Pore size distribution (a) and N_2 adsorption ability (b) of mixed valence state UV Mo-MOF.

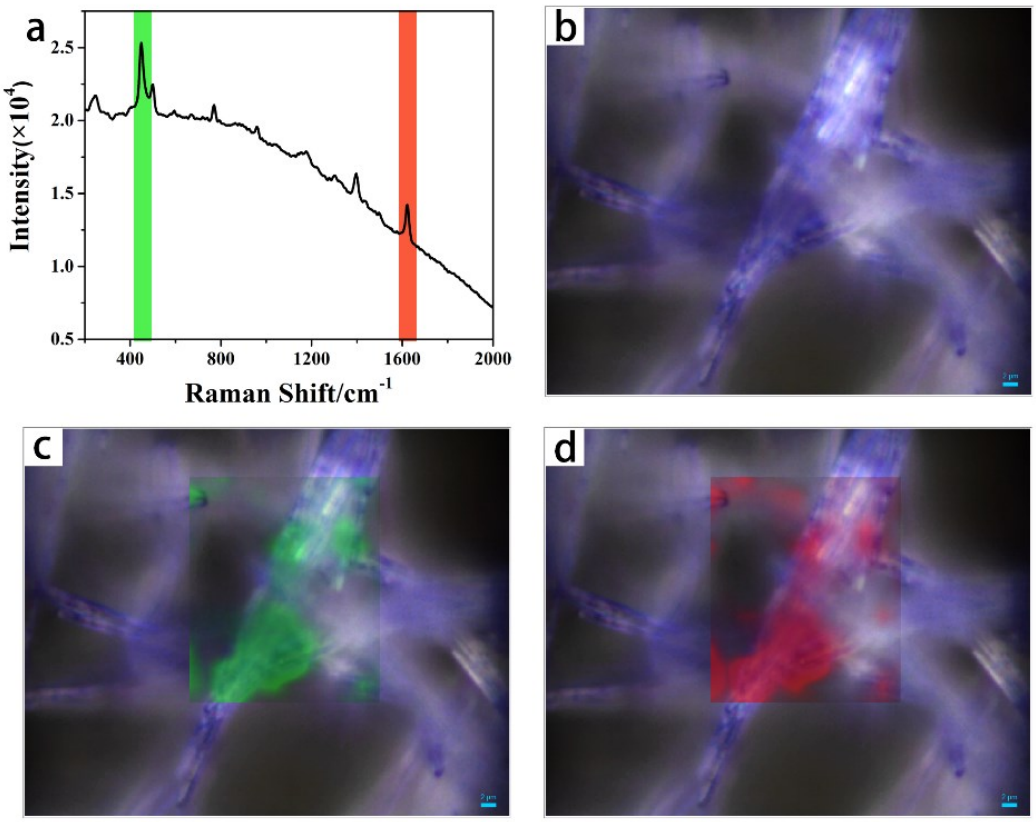

Fig. S8 The distribution of SERS signal of MB on mixed valence state UV Mo-MOF. (a) The SERS peak area region of MB (10^{-5} M) for mapping. (b) Optical photograph of mixed valence state UV Mo-MOF absorbed with MB. (c) Optical photograph covered with SERS mapping at 449 cm^{-1}. (d) Optical photograph covered with SERS mapping at 1623 cm^{-1}.

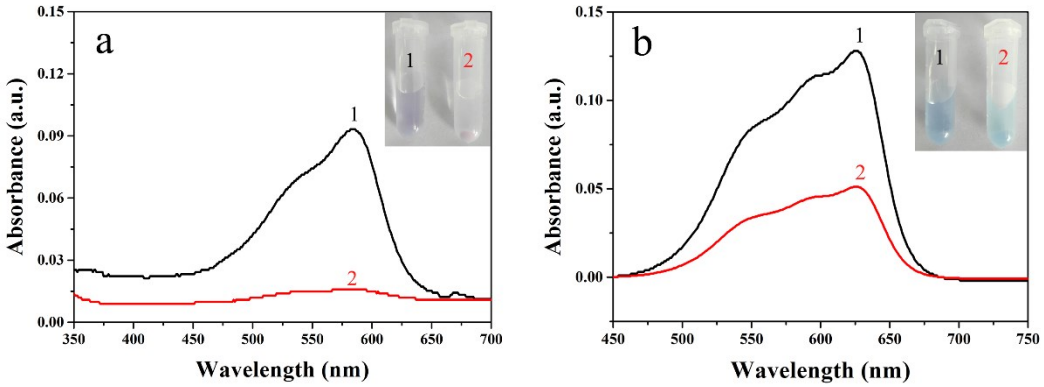

Fig. S9 The UV spectra of CV (a) and MB (b) before (1) or after (2) being absorbed by mixed valence state UV Mo-MOF.

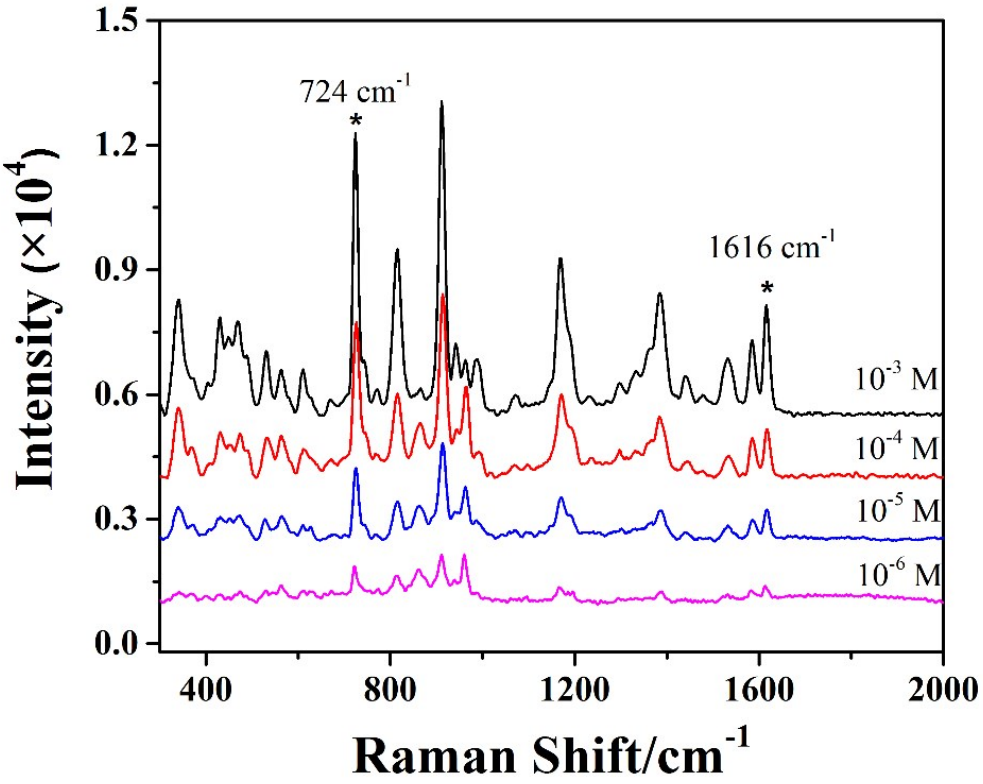

Fig. 10 Mixed valence state UV Mo-MOF SERS spectra of CV with different concentrations.

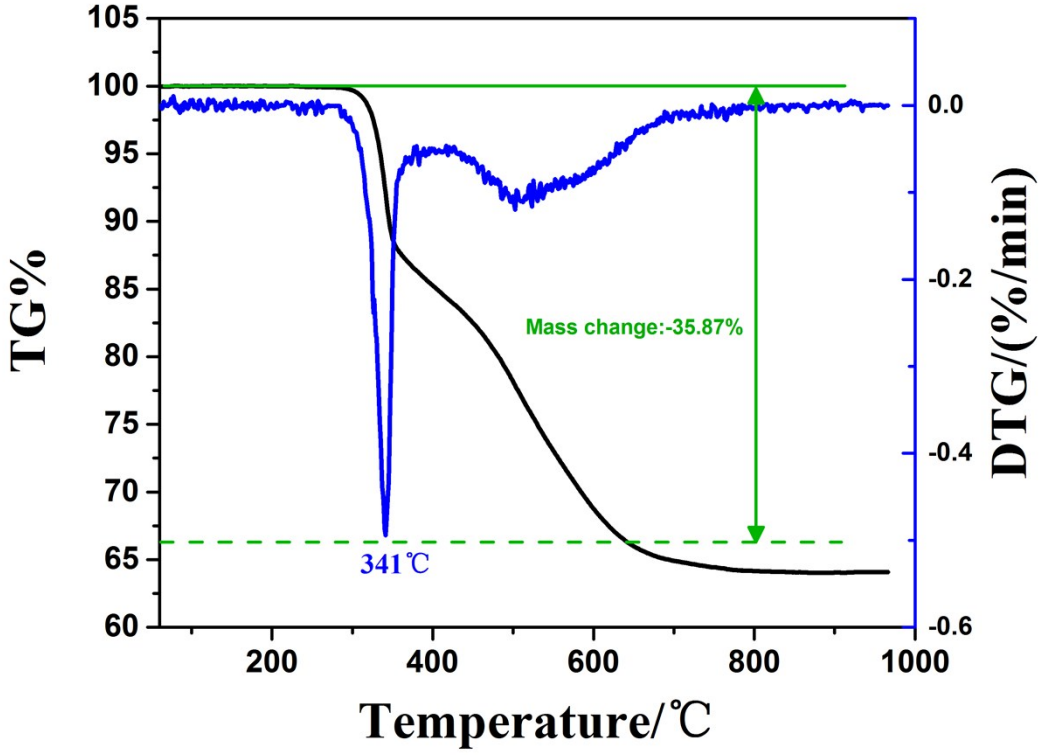

Fig. S11 The TGA of mixed valence state UV Mo-MOF.

66 **Table**

67 Table S1. The BET analysis results of UV Mo-MOF

Samples	BET surface area ($m^2 g^{-1}$)	BJH adsorption average pore width (nm)	BJH desorption average pore width (nm)	Pore volumes ($cm^3 g^{-1}$)
Mo-MOF	258.24	1.62	1.61	0.12
Mixed valence state UV Mo-MOF	203.65	1.68	1.69	0.13

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References

1. P. Martían-Zarza, J. M. Arrieta, M. C. Muñoz-Roca and P. Gili, *J. Chem. Soc., Dalton Trans*, 1993, 1551-1557..