

# Supplementary Material

## Efficient NO<sub>2</sub> sensing performance of low-cost nanostructured sensor derived from molybdenite concentrate

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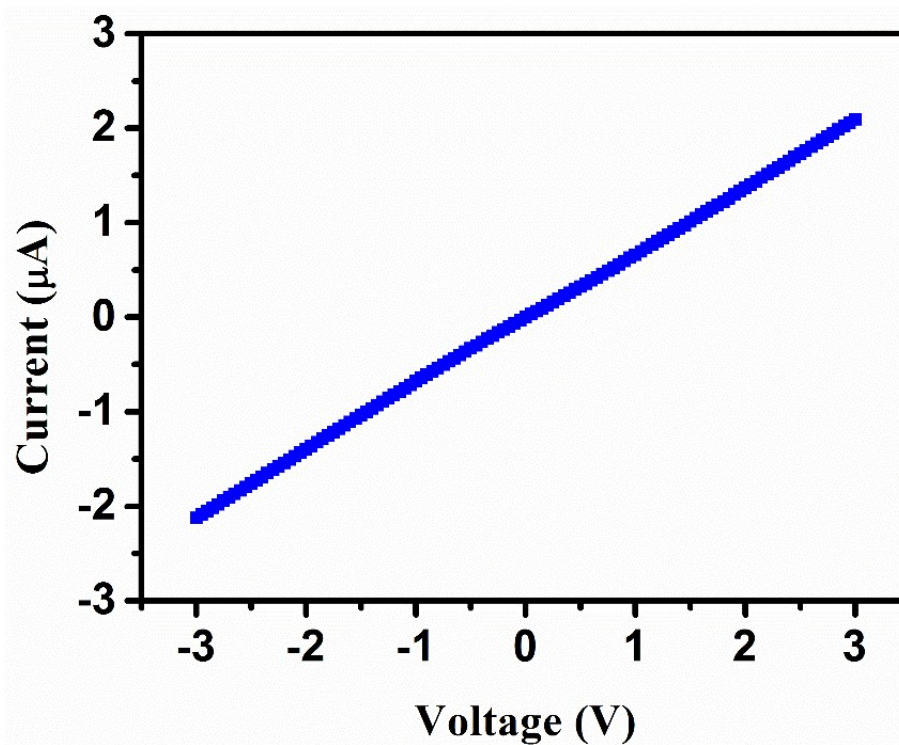
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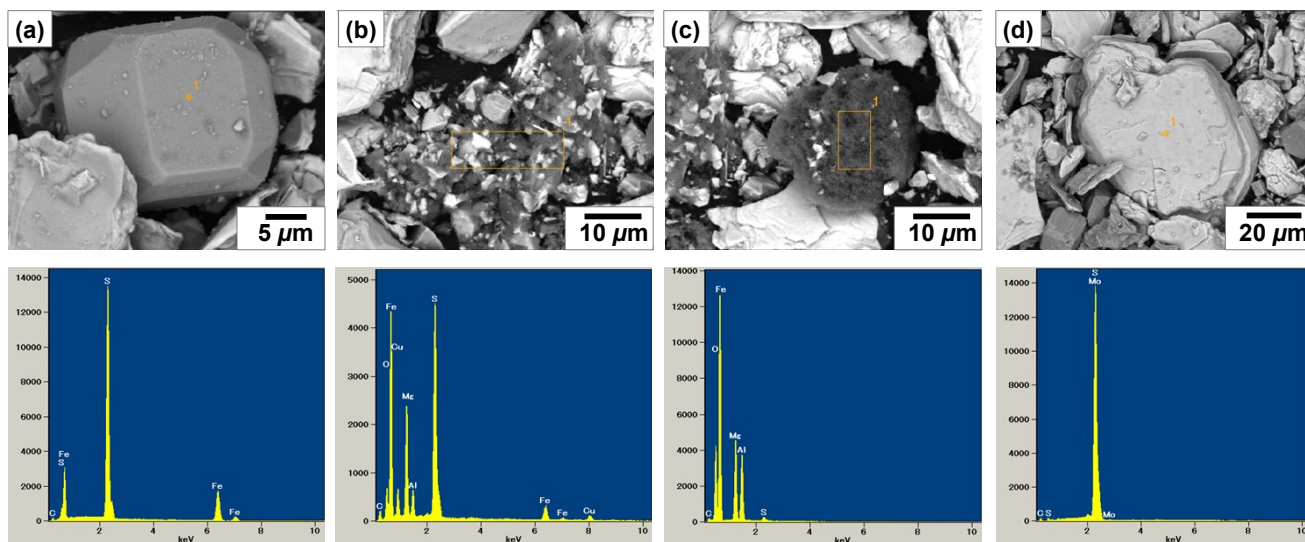
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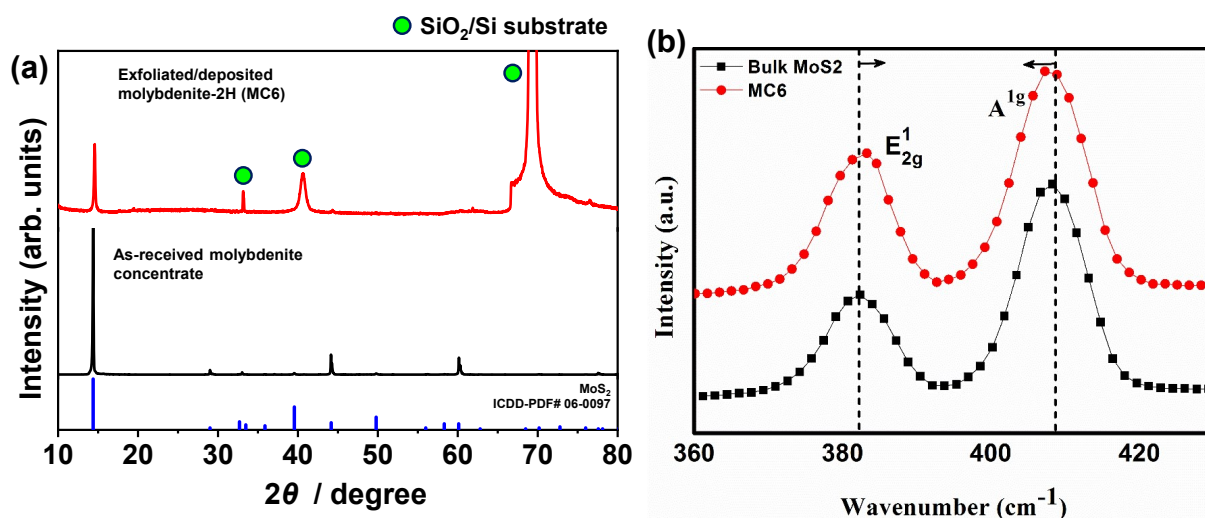
[khujamberdiev@tu-berlin.de](mailto:khujamberdiev@tu-berlin.de)



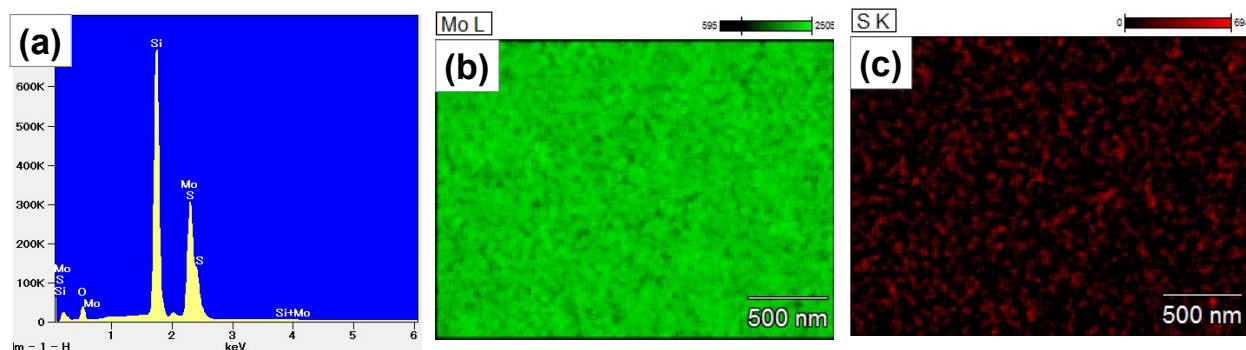
**Figure S1.** Current-voltage ( $I$ - $V$ ) characteristic curve of the fabricated sensing device.



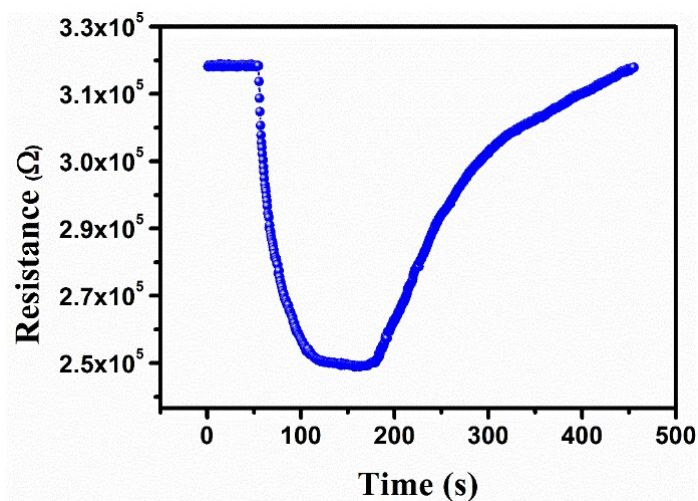
**Figure S2.** BSE-SEM images and EDX spectra of different particles of molybdenite concentrate



**Figure S3.** (a) XRD patterns of as-received molybdenite concentrate and exfoliated/deposited molybdenite-2H (sample MC6) and (b) Raman spectra of bulk MoS<sub>2</sub> and exfoliated MoS<sub>2</sub>.



**Figure S4.** EDX spectrum (a) and EDX elemental mapping images Mo (b) and S (c) of MC3 sample.



**Figure S5.** Sensing performance of molybdenite concentrate without removing any impurities against 10 ppm of NO<sub>2</sub> at 120°C.

**Table S1.** Comparison of NO<sub>2</sub> sensing performance of the device fabricated using molybdenite concentrate with previously reported data.

Material	Fabrication technique	Gas analyte	Gas concentration, %	Gas response, %	Temperature, °C	Ref.
<i>p</i> -MoS <sub>2</sub>	Liquid exfoliation	NO <sub>2</sub>	1	1.29	150	[1]
<i>n</i> -MoS <sub>2</sub>	Liquid exfoliation	NO <sub>2</sub>	1	5.80	200	[1]
MoS <sub>2</sub>	CVD	NO <sub>2</sub>	100	35.16	RT	[2]
MoS <sub>2</sub>	Hydrothermal	NO <sub>2</sub>	100	40.3	150	[3]
3D MoS <sub>2</sub> aerogel	Two-step sulfurization treatment	NO <sub>2</sub>	0.5	12	200	[4]
MoS <sub>2</sub>	Mechanical exfoliation	NO <sub>2</sub>	1000	1372	RT	[5]
MoS <sub>2</sub>	CVD	NO <sub>2</sub>	10	10.36	RT	[6]
Molybdenite-2H	Liquid nitrogen exfoliation	NO <sub>2</sub>	100	67	50	this work

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