Supplementary Information


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**Figure S1.** Diagrams of the band-bending on (a) Pd/MoS$_2$ and (b) Al/MoS$_2$ interfaces. The $E_F$ is Fermi level of Pd and MoS$_2$ aligned after junction formation. The $E_C$ and $E_V$ are the conductance and valance band edges of MoS$_2$, respectively.

**Figure S2.** Cyclic gas-sensing performance of flexible Pd:MoS$_2$ gas-sensing device under NH$_3$ 30 ppm, showing a highly reproducible sensing behavior.

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