

Supporting information for  
**An Ultra-Sensitive and Recyclable FET-Type Toxic Gas Sensor  
Based on WTe<sub>2</sub> Monolayer**

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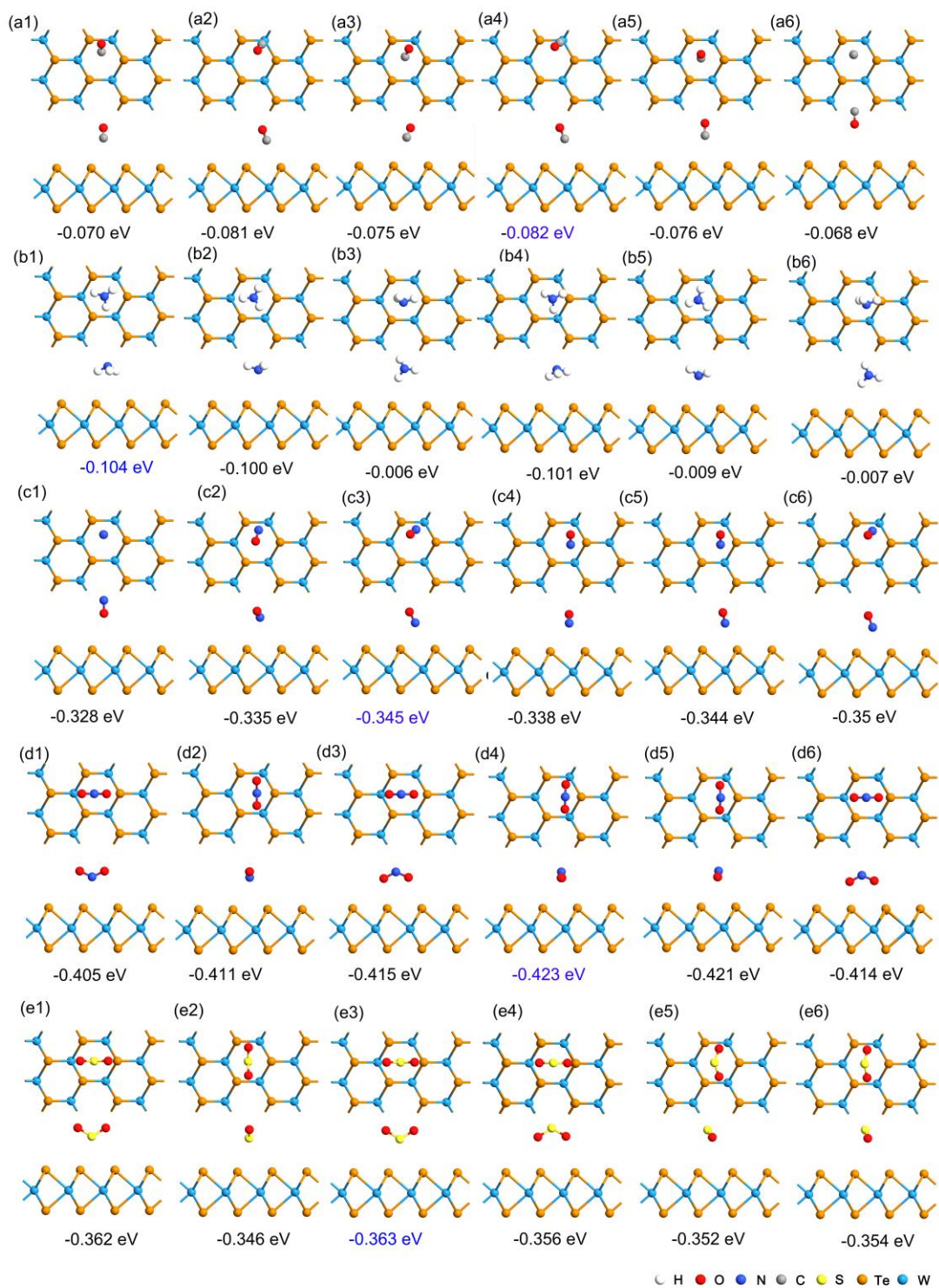


Fig. S1 Possible adsorption configurations and corresponding adsorption energies of the gas molecules adsorbed on the pure WTe<sub>2</sub> monolayer. The adsorption energy marked by blue color corresponds to the most stable adsorption configuration.

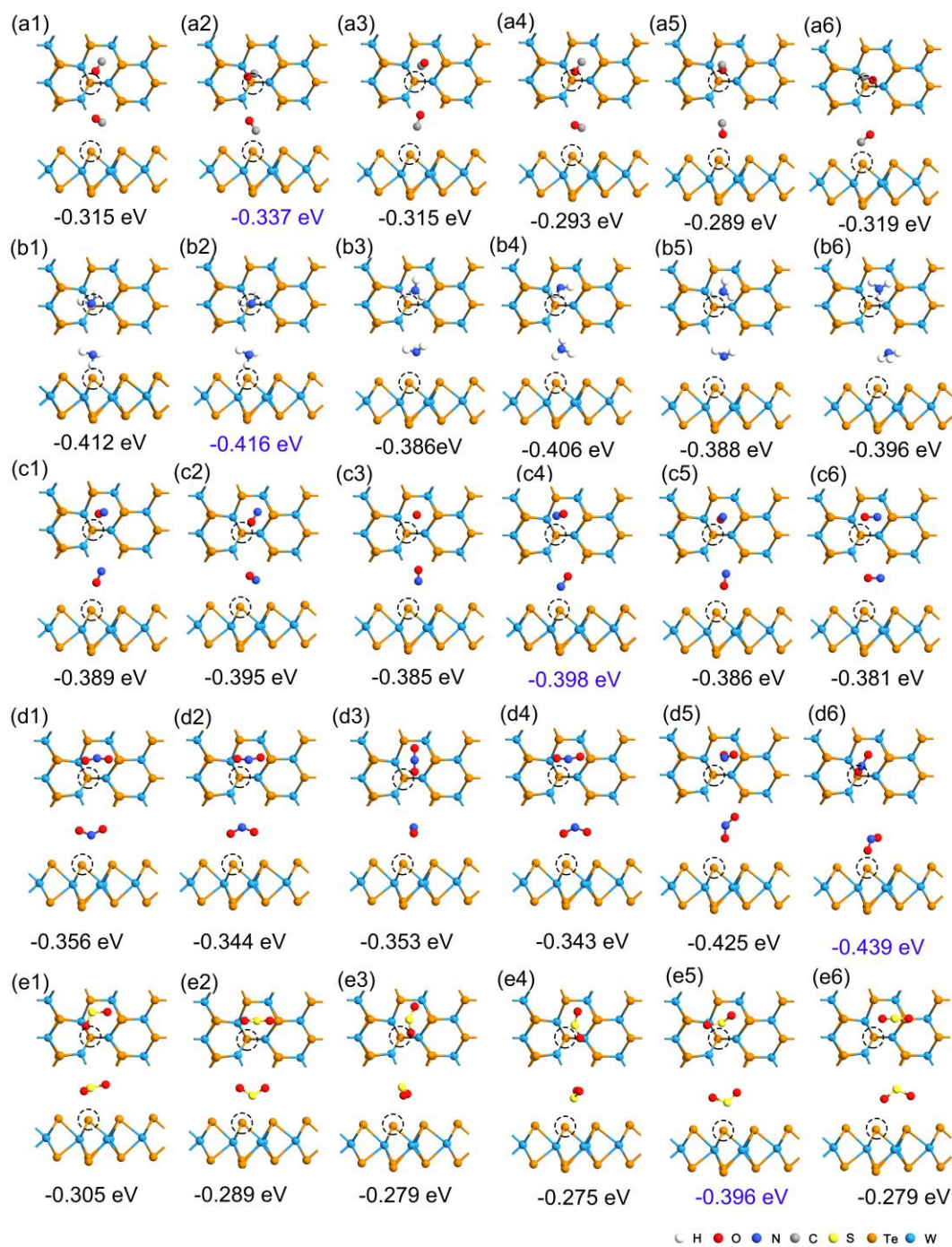


Fig. S2 Possible adsorption configurations and corresponding adsorption energies of the gas molecules adsorbed on the defective  $WTe_2$  monolayer. The adsorption energy marked by blue color corresponds to the most stable adsorption configuration. The circles marked by black dashed lines mean the Te vacancies.

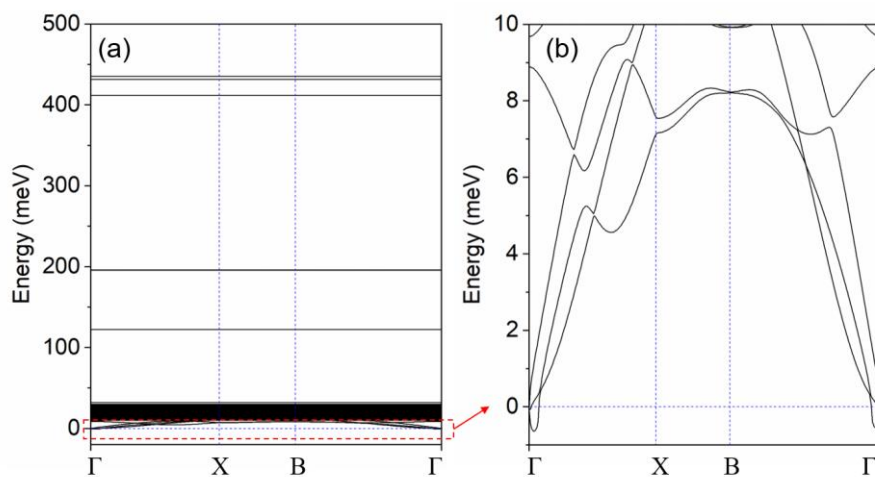


Fig. S3 (a) The phonon spectra of NO<sub>2</sub>-defective WTe<sub>2</sub> adsorption system. (b) The phonon spectra of NO<sub>2</sub>-defective WTe<sub>2</sub> adsorption system around the Fermi level.

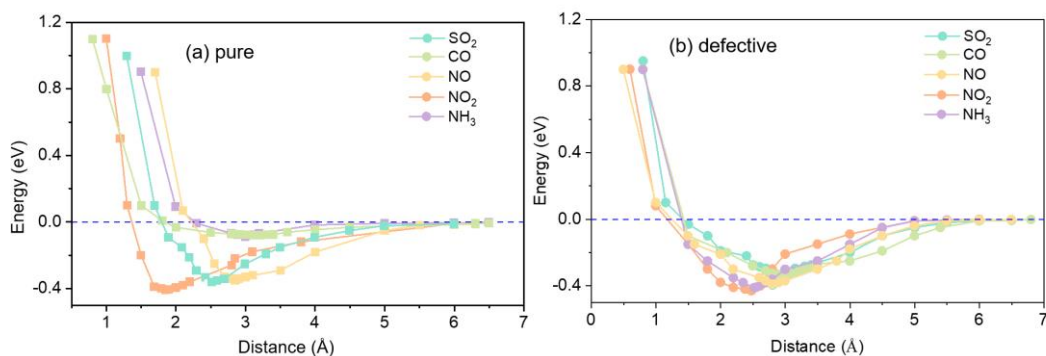


Fig. S4 The Morse potential as function of the distance of the (a) pure WTe<sub>2</sub> and (b) defective WTe<sub>2</sub> adsorption systems.

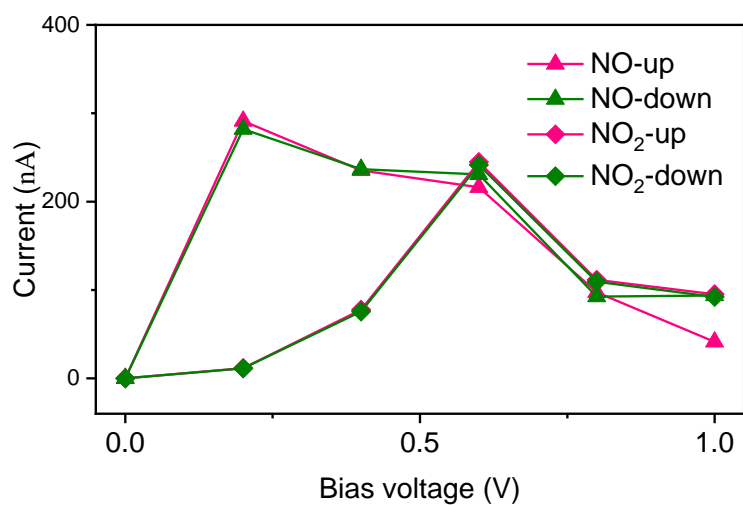


Fig. S5 The spin-resolved current of the NO and NO<sub>2</sub> adsorbed pure WTe<sub>2</sub> FET-type gas sensors.