

Article

# Oxygen Adsorption Induced Superconductivity in Ultrathin FeTe Film on SrTiO<sub>3</sub>(001)

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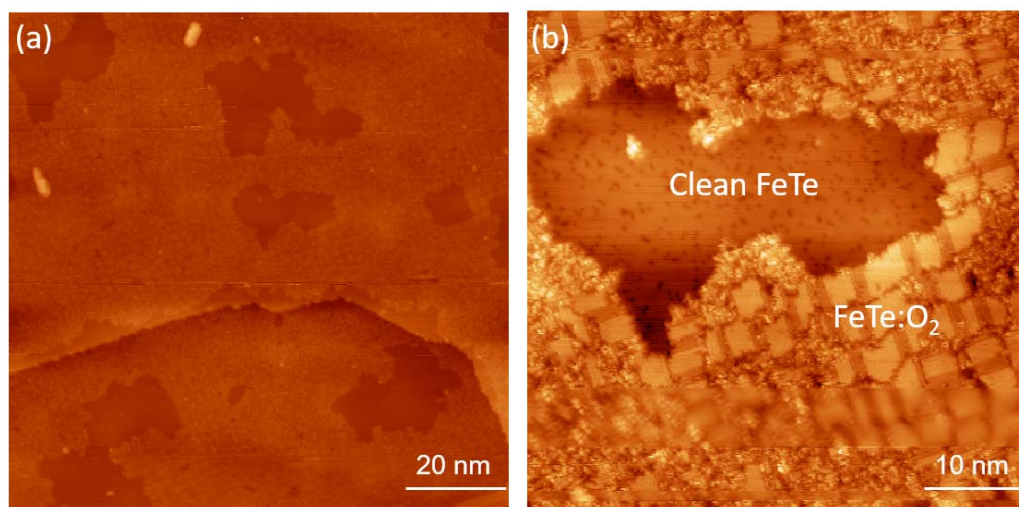
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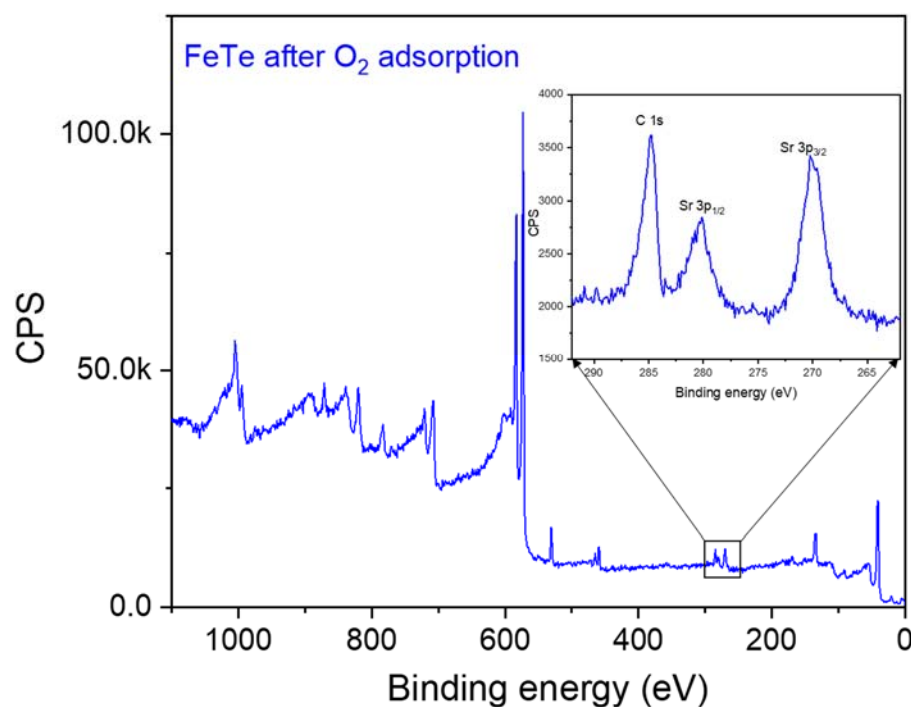
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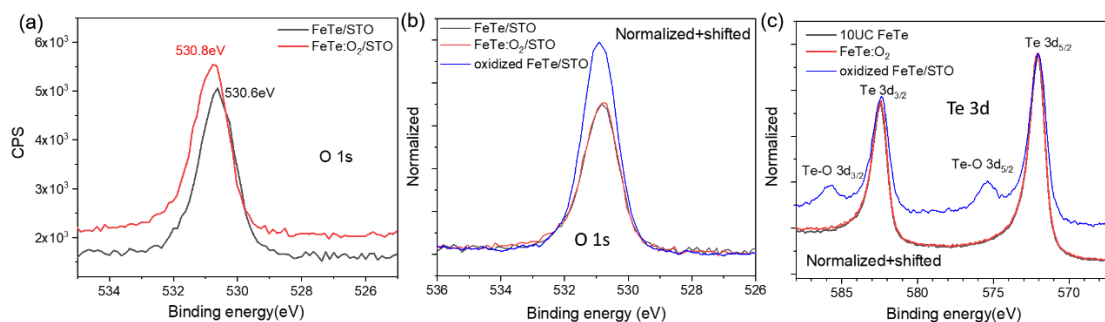
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**Figure S1.** (color online) (a) Surface topography (100 nm × 100 nm) of the 10UC FeTe films after exposure to O<sub>2</sub> under  $1.6 \times 10^{-4}$  mbar for 4 hours at room temperature. Scanning condition:  $V_s = 3$  V,  $I_t = 100$  pA. (b) Enlarged view (50 nm × 50 nm) of surface topography, showing clean FeTe surface with O<sub>2</sub> overlayer. Scanning condition:  $V_s = 1$  V,  $I_t = 100$  pA.



**Figure S2.** (color online) The XPS survey scan on 10 UC FeTe after O<sub>2</sub> adsorption, showing no other impurities can be observed after O<sub>2</sub> inlet.



**Figure S3.** (color online) (a) The XPS core level spectra of O 1s before and after O<sub>2</sub> inlet, showing similar shift as Te 3d and Fe 2p. (b, c) The normalized and shifted XPS core level spectra of O 1s (b) and Te 3d (c) on 10 UC FeTe before and after O<sub>2</sub> adsorption, showing the shapes of O 1s or Te 3d are nearly overlapped. We also added the XPS spectra on the oxidized FeTe/STO when exposure to O<sub>2</sub> partial pressure of  $1.5 \times 10^{-1}$  mbar for 20 mins.