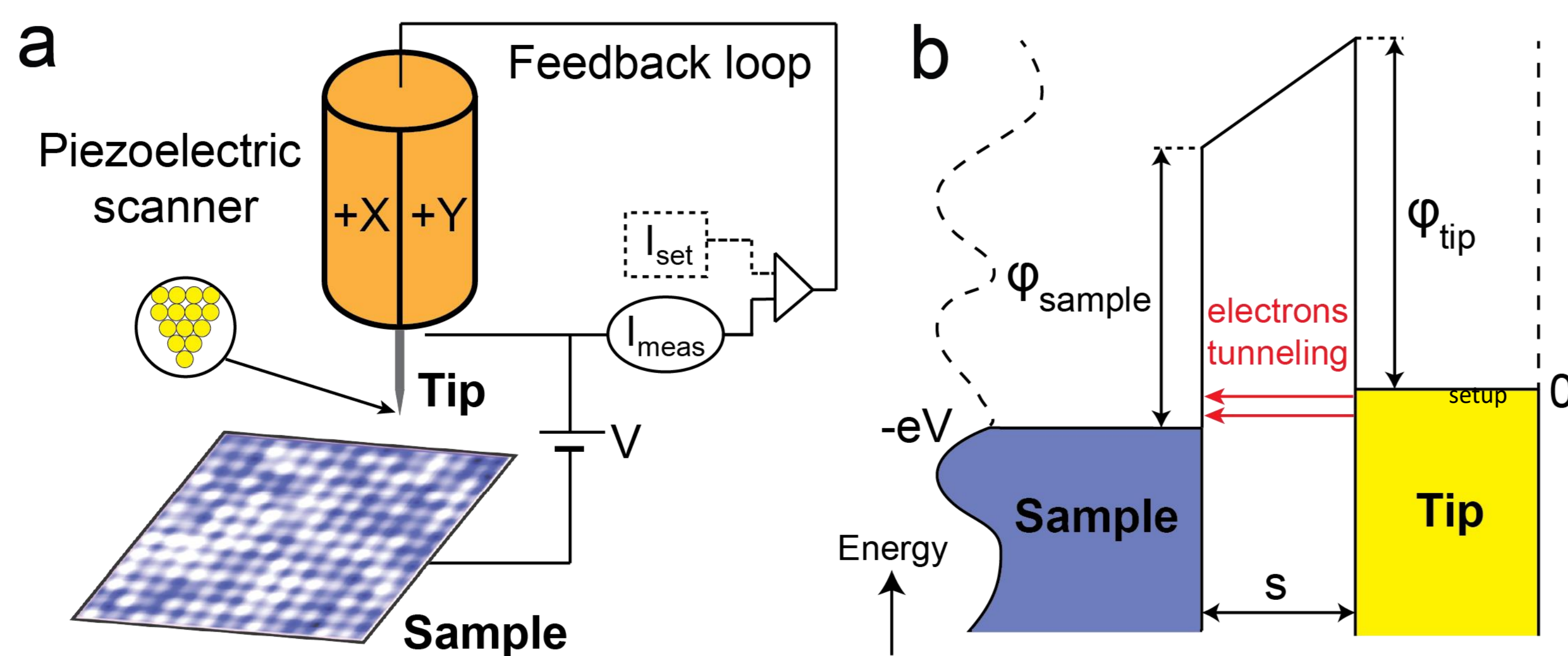# STM and STS measurements of GO layers

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1. Solid State Institute, Technion –Israel Institute of Technology, Israel. 2. Physics Department, Ariel University, Israel.
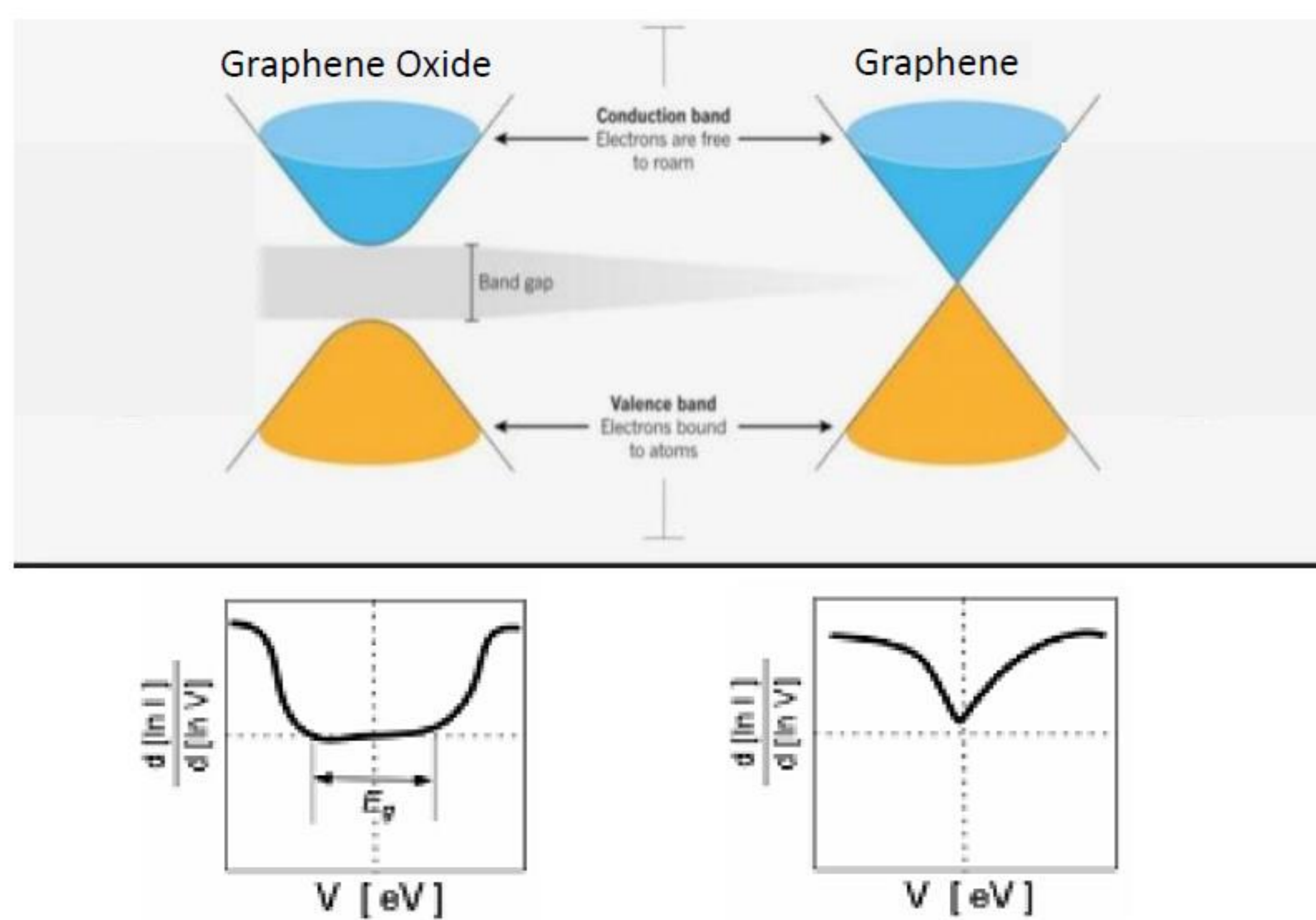
Effective Reduction Process

As-purchaised → Short bath ultrasonic sonication → Water Rinsing

Scheme of STM measurement setup

a — Feedback loop, Piezoelectric scanner, +X +Y, I_{set}, I_{meas}, Tip, V, Sample

b — φ_{sample}, φ_{tip}, electrons tunneling, -eV, Sample, Tip, Energy, s, setup, 0

Expected STS behavior of Graphene Oxide and Graphene samples

STM and STS measurements of Multilayer GO before treatments
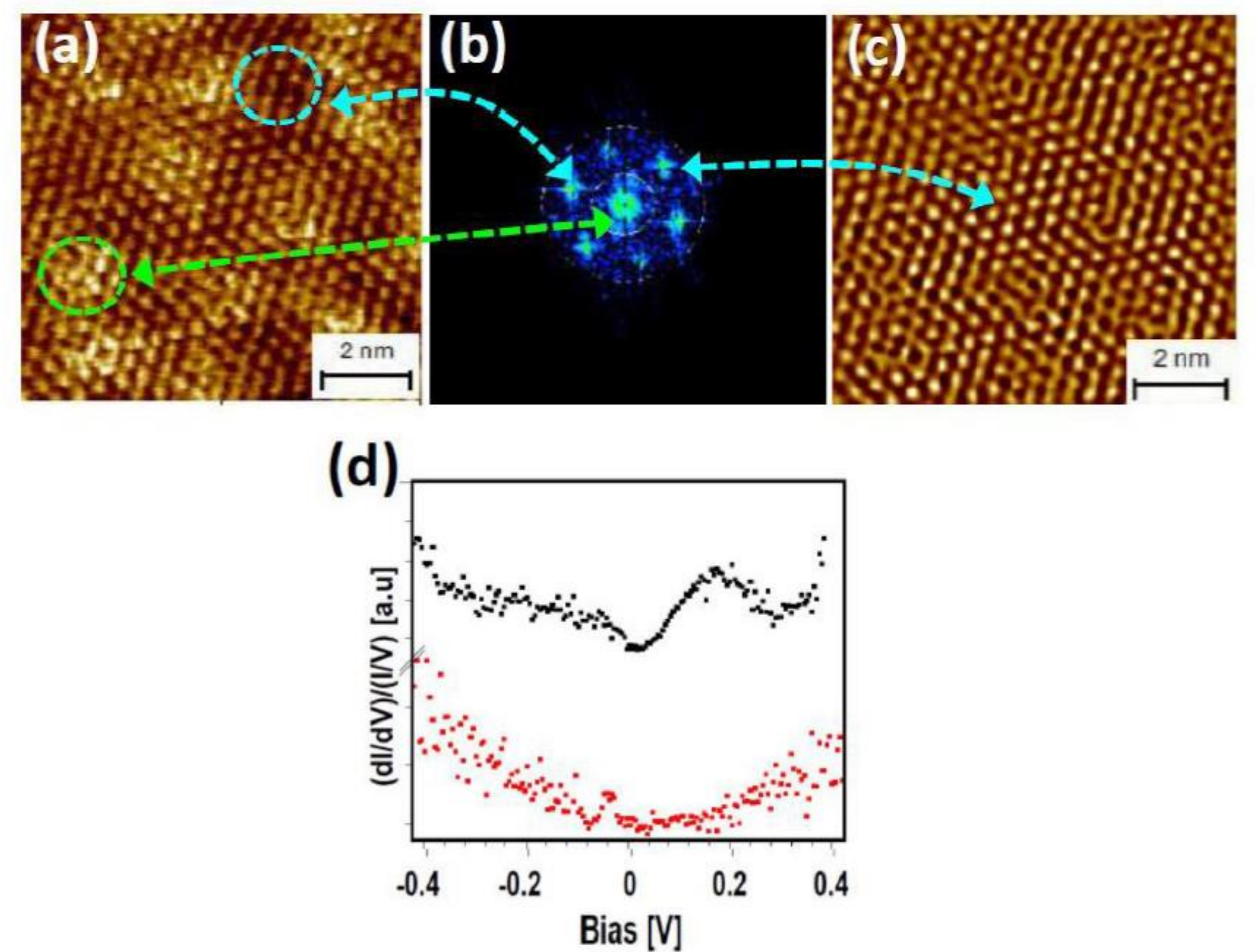

Figure 1: Characterization of the as-purchased GO multilayer samples: (a) A STM image; (b) Fourier transform of image in (a), showing two distinct regions: An inner part at low frequency, corresponding to a distorted region as framed by a green circle in (a); An outer-ring at a higher frequency, related to the "graphenic" region marked by blue circle in (a). (c) Inverse Fourier transform image considering only the higher frequencies in (b). (d) Two STS curves have wide parabolic behavior (red) and flat curve which has a shoulder at 0.2eV (black) comes from two different STM tip positions.

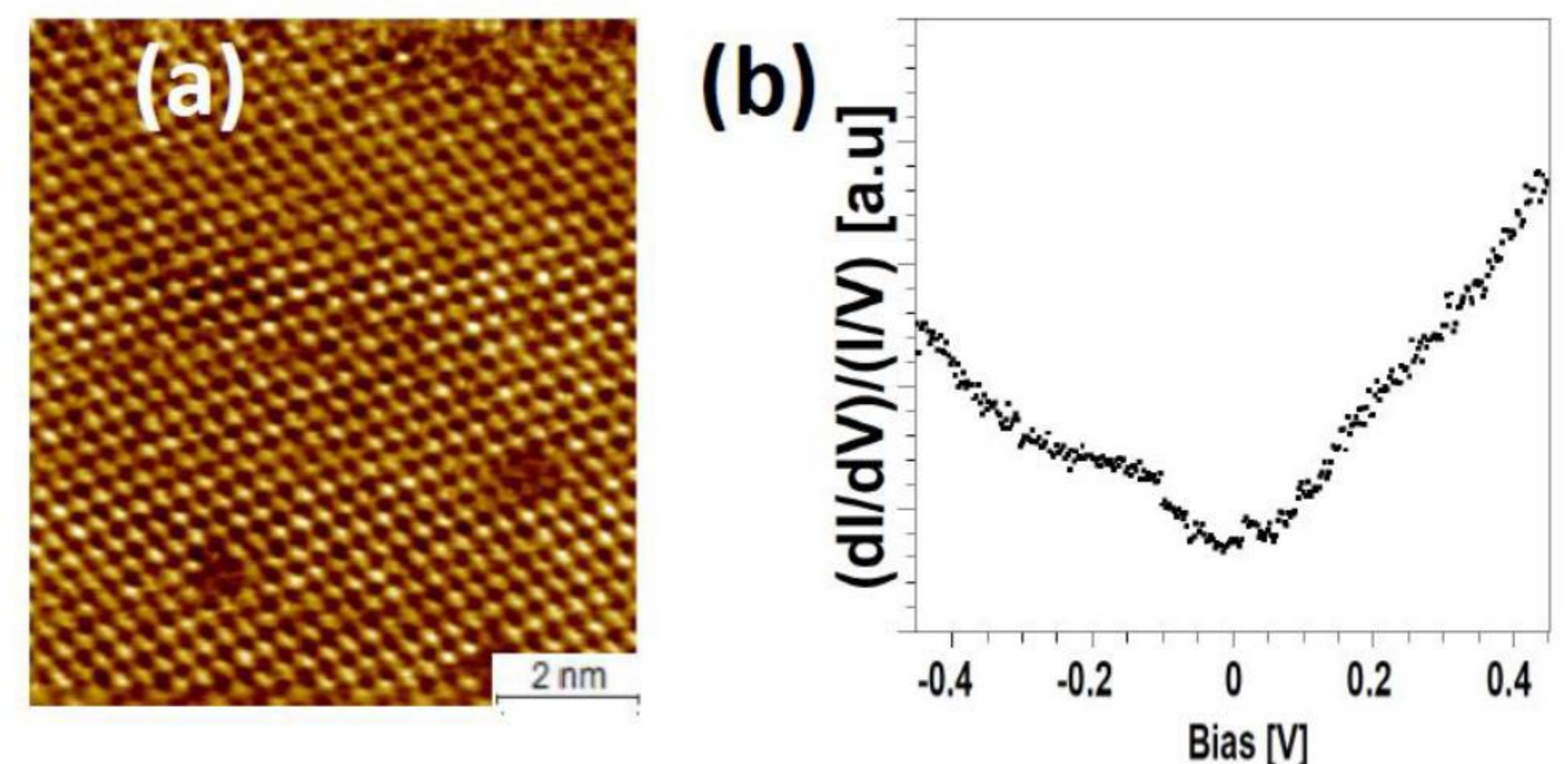## STM and STS measurements of a single GO layer after treatments

Figure 2: Characterization of the GO samples after the sonication and the water rinsing processes: (a) STM topography image of single layer and (b) STS curve from image (a) where shown non-symmetric dI/dV normalized curve with a hint of the oxygen shoulder near -0.2 V

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REFERENCES

Seri-Livni, Orit, et al., "Effective Reduction of Oxygen Debris in Graphene Oxide", *arXiv preprint arXiv:2006.15668* (2020).