

STM Tips Additional Information

Emission from a point above the probe apex can cause “shadow images” such as the one next to the real image of the structure shown in Fig. 1. This STM image was supplied by Laura Ruppalt and Professor Joseph Lyding at the University of Illinois.

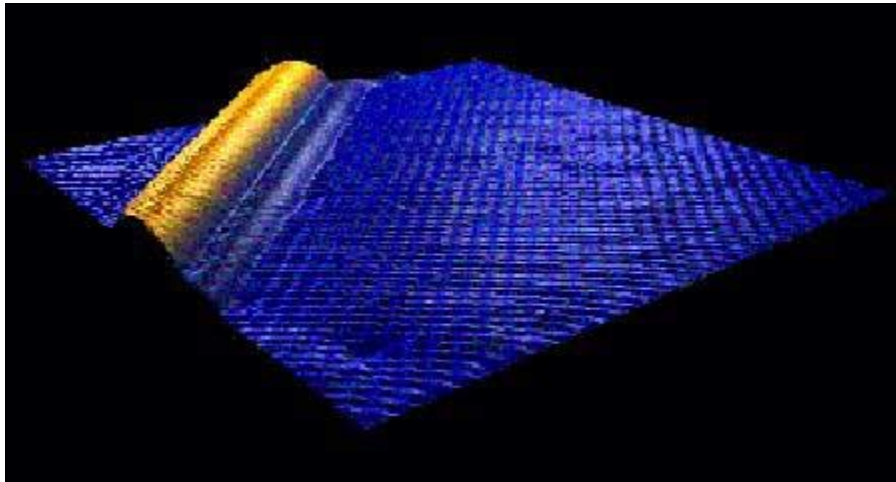


Fig 1: High resolution STM image of a carbon nanotube on GaAs(110) using a standard STM probe

Performance comparisons of single crystal and polycrystalline tungsten tips were made at Washington State University by Professor Ursula Mazur and associates. They "found that the SCW tips were consistently superior to the W(poly) tips providing higher quality images than the W(poly) tips." The following pictures are from their work.

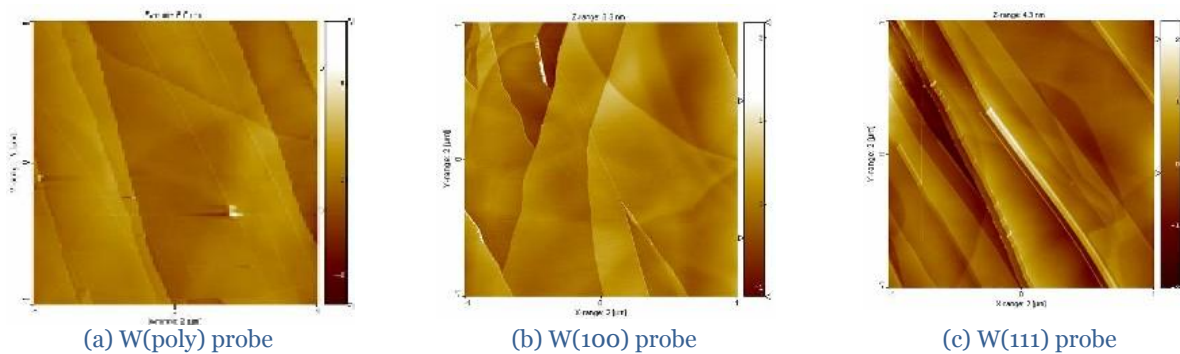
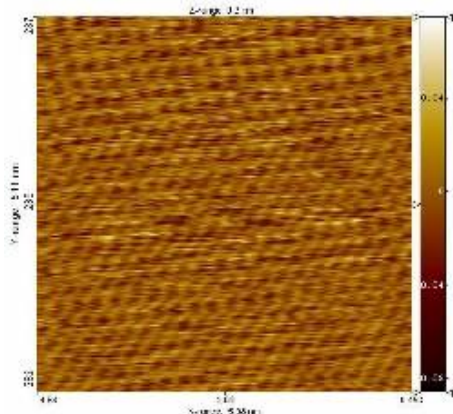
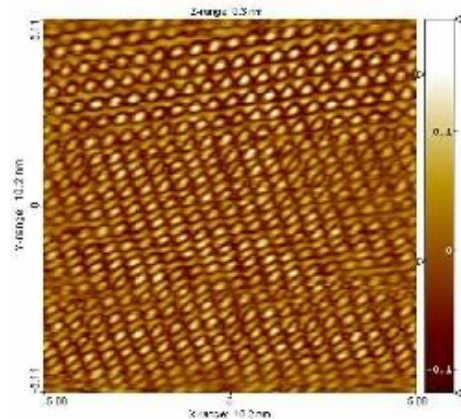


Fig 2: Highly oriented pyrolytic graphite (HOPG) imaged under ambient conditions in Molecular Imaging Pico Plus STM using W(poly) probe, W(100) probe and W(111) probe.

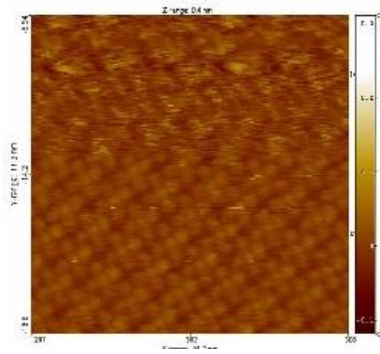


(a) W(poly) probe

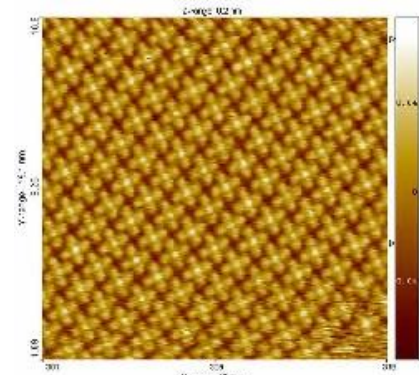


(b) W(111) probe

Fig. 3: HOPG surface imaged in RHK vacuum STM using W(poly) probe, and W(111) probe.



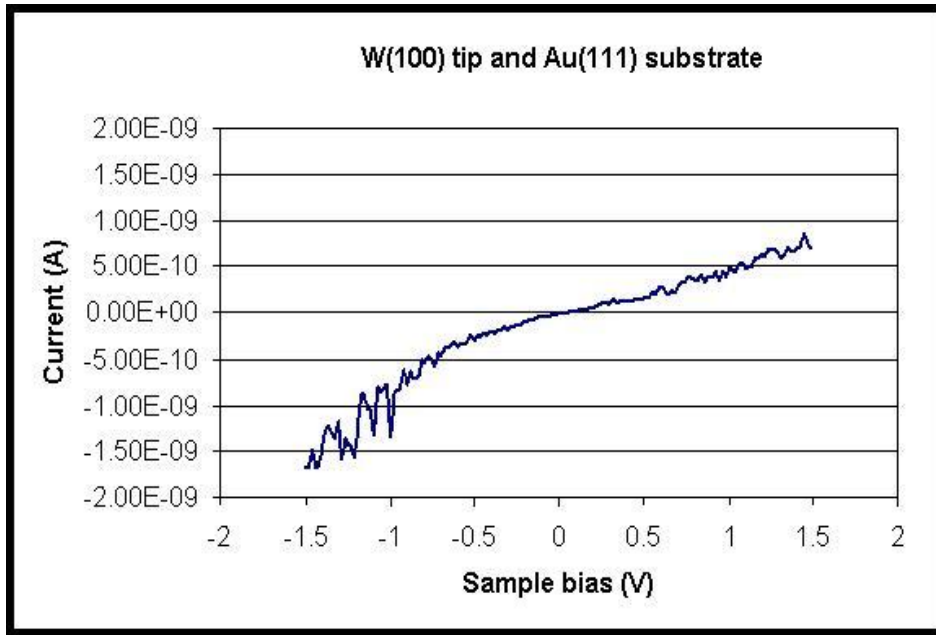
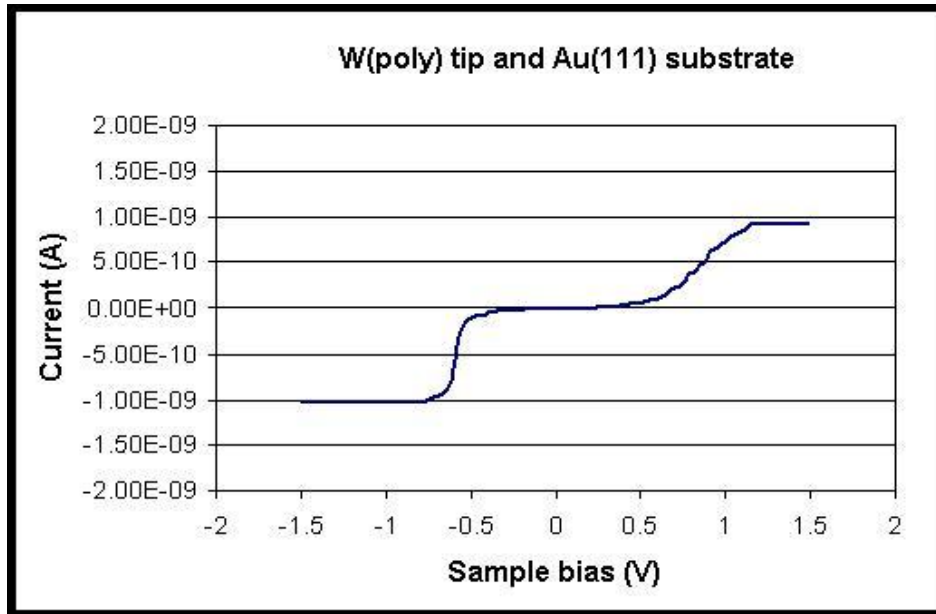
(a) W(poly) probe

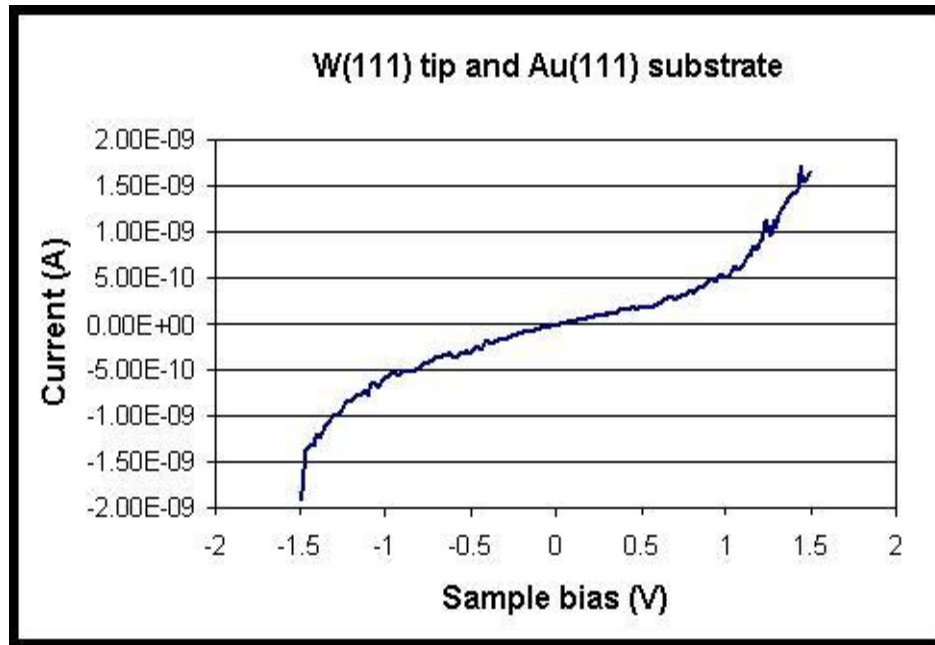


(b) W(111) probe

Fig 4: Images of cobalt phthalocyanine formed by redox deposition on Au(111) substrate using W(poly) probe and W(111) probe.

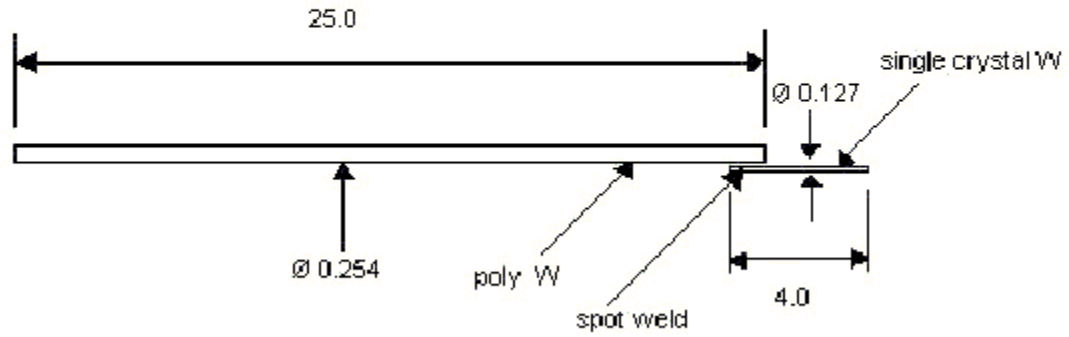
IV Data Comparison Against Au(111) Surface in RHK Vacuum STM:



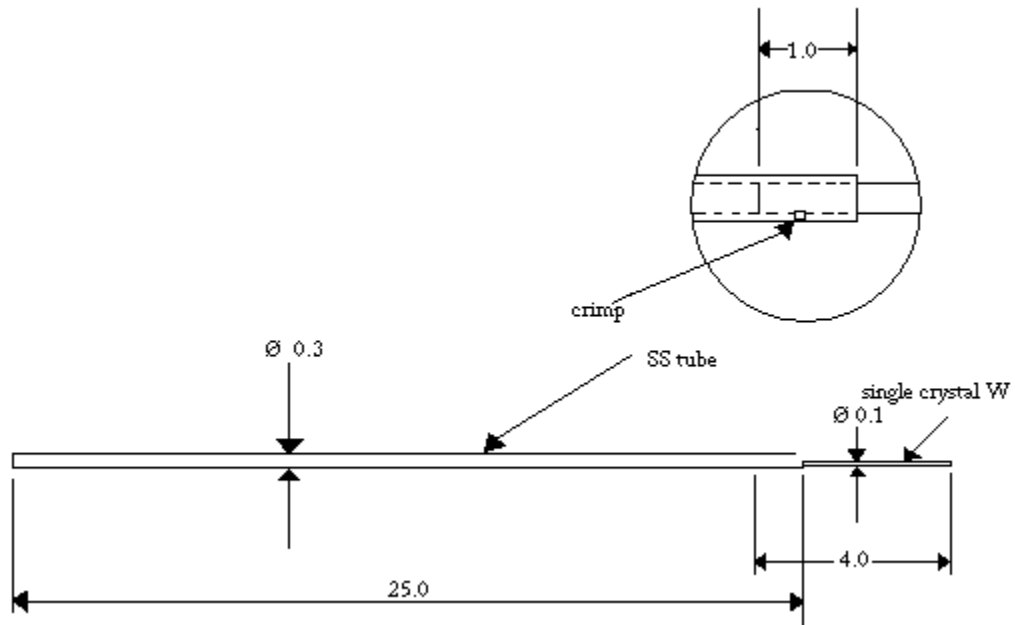


“The I-V data are the results of single and not averaged measurements. It is clear that the W(111) tip yields a very quiet spectrum. The I-V curve obtained with W(poly) tip breaks down at ~ 0.5 V because of the presence of metal oxides on the tip surface. I think that because of the orientation of the SCW, the tungsten oxide layer on the SCW tips is thinner than on the W(poly) tip.” - Ursula Mazur (Washington State University)

Probe Mount Options:



Single crystal tungsten wire mounted on poly wire STM probe blank (unetched)



Single crystal tungsten mounted in SS tube STM probe blank (unetched).