Abstract Submitted
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Characterizing Defects Generated in Graphene by Scanning Probe Microscopy[1] JONATHON DAVID WHITE, Yuan Ze University, Taiwan, HSIAO-MEI CHIEN, MIN-CHIANG CHUANG, HUNG-CHIEH TSAI, National Central University, Taiwan, HUNG-WEI SHUI, LO-YUEH CHANG, CHIA-HAO CHEN, National Synchrotron Radiation Research Center, Taiwan, SHENG-WEI LEE, WEI-YEN WOON, National Central University, Taiwan — Graphene was prepared by chemical vapor deposition (CVD). Defects with differing topographical and tribological properties were then created by scanning probe lithography (SPL) under ambient conditions. The nature of these defect structures was then investigated by micro-Raman (μ-RS) and micro-X-ray photoelectron (μ-XPS) spectroscopy. Investigation of these structures suggests that, despite their physical differences, similar defects are present in both structures. In particular, μ-RS indicated that the ratio of the defect Raman peaks and the effective distance between defects had a similar magnitude and dependence on the applied bias voltage during SPL for all topographies. μ-XPS revealed no evidence of the generation of sp^3-type defects. The small amplitude of the C-C peak and absence of C=O and C-OH peaks, suggest a complete absence of graphene oxide in the defect areas. We propose that a common active mechanism - bond reconstruction - is responsible for both structures.

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