Layer Number and Stacking Order Imaging of Few-layer Graphenes by Transmission Electron Microscopy JINGLEI
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Materials, University of Maryland, College Park — A method using
transmission electron microscopy (TEM) selected area electron diffraction (SAED) patterns and dark field (DF) images is developed to identify
graphene layer number and stacking order by comparing intensity ratios
of SAED spots with theory. Graphene samples are synthesized by ambient pressure chemical vapor depostion and then etched by hydrogen
in high temperature to produce samples with crystalline stacking but
varying layer number on the nanometer scale. Combined DF images
from first- and second-order diffraction spots are used to produce images with layer-number and stacking-order contrast with few-nanometer
resolution. This method is proved to be accurate enough for quantative stacking-order-identification of graphenes up to at least four layers.
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