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【142】Identification of Defect-Sensitive Raman Modes in 9-Atom-Wide Armchair Graphene Nanoribbons

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Graphene nanoribbons (GNRs) are narrow strips of graphene with width-dependent electronic bandgaps, making them promising building blocks for nanoelectronic devices. However, structural defects can alter their electronic and optical properties, making defect characterization in GNRs a crucial step towards their further development. We use angle-resolved polarized Raman spectroscopy and density functional theory calculations to identify defect-sensitive Raman modes in 9-atom-wide armchair GNRs. Our results demonstrate that specific Raman peaks, namely the D and CH modes, exhibit distinct deviations from theoretically predicted angular dependence, serving as fingerprints for defect presence. These results provide valuable insights for non-destructive characterization of GNR quality and pave the way for defect en-gineering in GNR-based devices.

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