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Nanostructures graphene plasmon works close to near-infrared window

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[2] I. Goykhman, U. Sassi, B. Desiatov, N. Mazurski, S. Milana, D. De Fazio, A. Eiden, J. Khurgin, J. Shappir, and U. Levy, Nano Lett. 16, 3005 (2016).

Figures

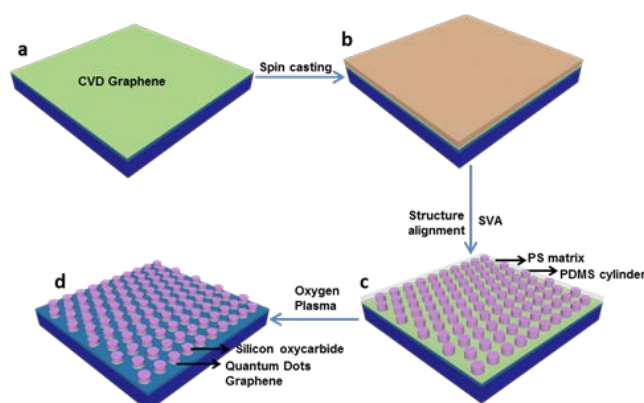


Figure 1: Fabrication of graphene nanodisk arrays (GNDAs) by direct block copolymer nanolithography.

Abstract (Century Gothic 11)

Due to strong mode-confinement, long propagation-distance, and unique tunability, graphene plasmons have been widely explored in the mid-infrared and terahertz windows. However, it remains a big challenge to push graphene plasmons to shorter wavelengths in order to integrate graphene plasmon concepts with existing mature technologies in the near-infrared region. We investigate localized graphene plasmons supported by graphene nanodisks and experimentally demonstrated graphene plasmon working at 2 μm with the aid of a fully scalable block copolymer self-assembly method. Our results show a promising way to promote graphene plasmons for both fundamental studies and potential applications in the near-infrared window.

References

[1] F. Bonaccorso, Z. Sun, T. Hasan, and A. Ferrari, Nature Photon. 4, 611 (2010).

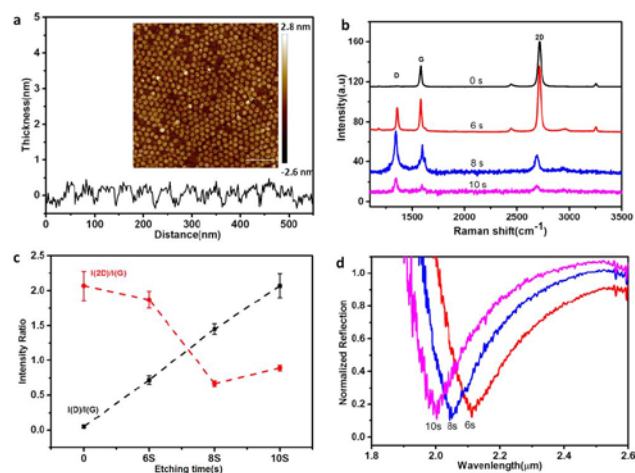


Figure 2: (a) AFM line-scan profile of GNDAs on SiO₂/Si substrate after 8 s of oxygen plasma. Inset, corresponding AFM image; scale bars, 200 nm. (b) Raman spectra; (c) evolution of the peak intensity ratios and (d) normalized reflection spectra for the GNDAs/Silicon oxycarbide nanodisk formed after 6, 8, and 10 s of oxygen plasma.