Synthesis and characterization of two-dimensional indium gallium nitride (2D $In_xGa_{1-x}N$) via graphene encapsulation

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Supplementary figures for further information

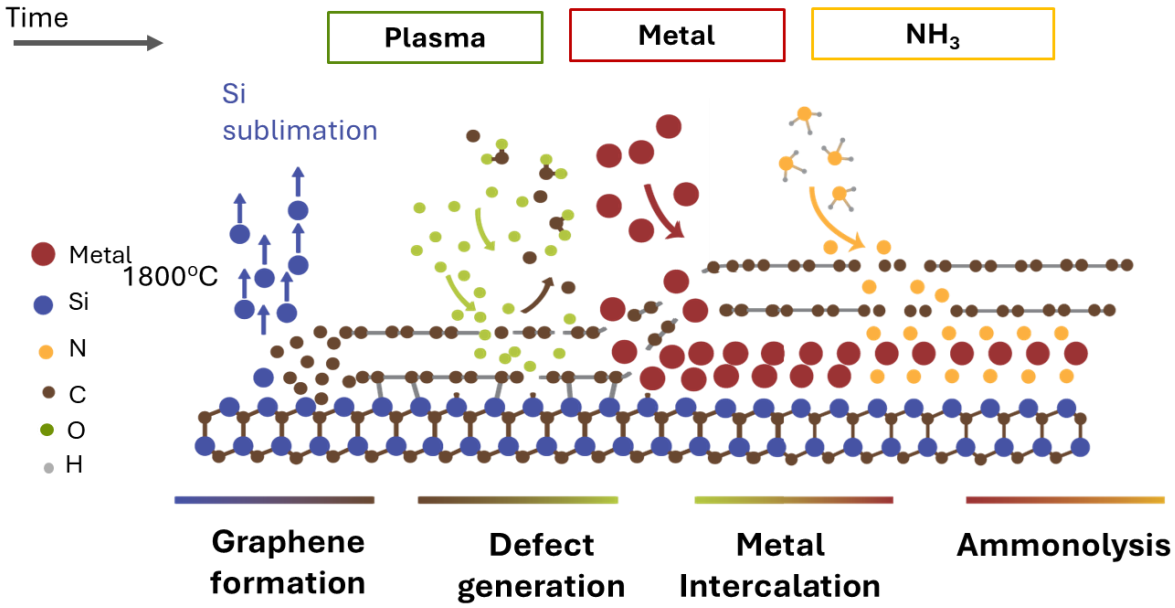

Figure 1. Schematic of confinement heteroepitaxy (CHet). The epitaxial graphene (EG) growth by Si sublimation from SiC, O2 plasma treatment to engineer defects in EG and metal intercalation followed by ammonolysis for nitrogen intercalation for large-area coverage of 2D III-nitrides

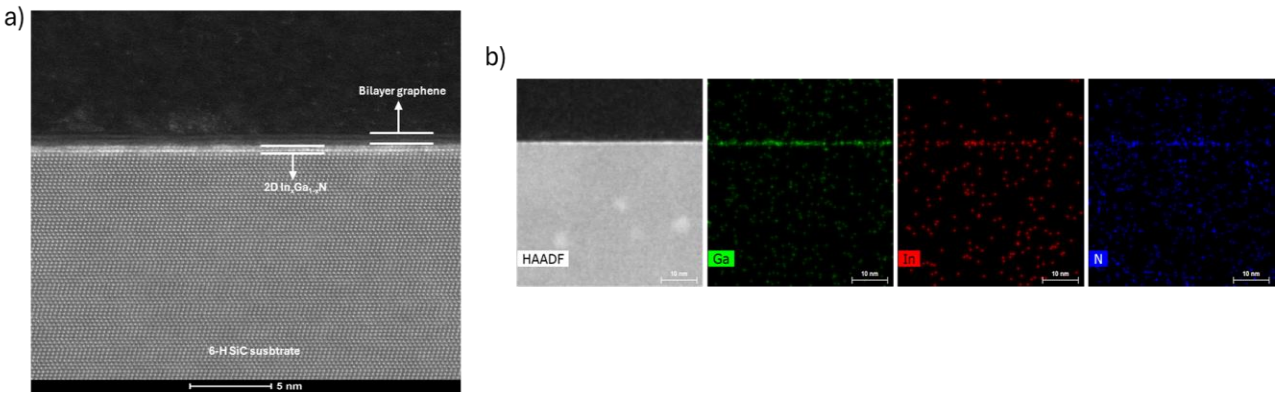

Figure 2. a) Cross sectional STEM of 2D $In_xGa_{1-x}N$ between in bilayer graphene and SiC interface. b) HAADF-STEM and elemental EDS mapping of gallium, indium and nitrogen.

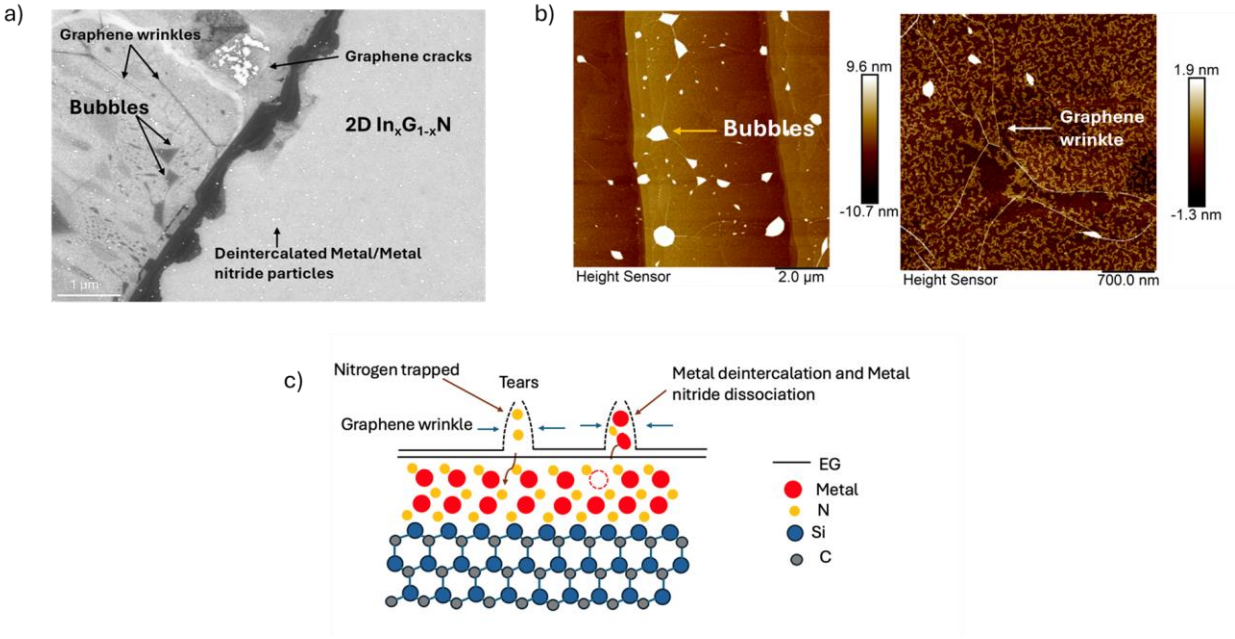

Figure 3 a) Scanning electron microscopy (SEM) of 2D $In_xGa_{1-x}N$ between EG/SiC interface demonstrating graphene wrinkles, bubbles and cracks. b) Atomic force microscopy (AFM) image of 2D $In_xGa_{1-x}N$ with graphene wrinkles and bubbles. c) Schematic image of nitrogen trapped in graphene as bubbles during ammonolysis and creates wrinkles in EG.