Feasibility study of single and multi-layered graphene as plasma-compatible deactivation layers for selective deposition of III-nitride materials

Petro Deminskyi, Evgenia Kovalska, Ali Haider, Coskun Kocabas, and Necmi Biyikli

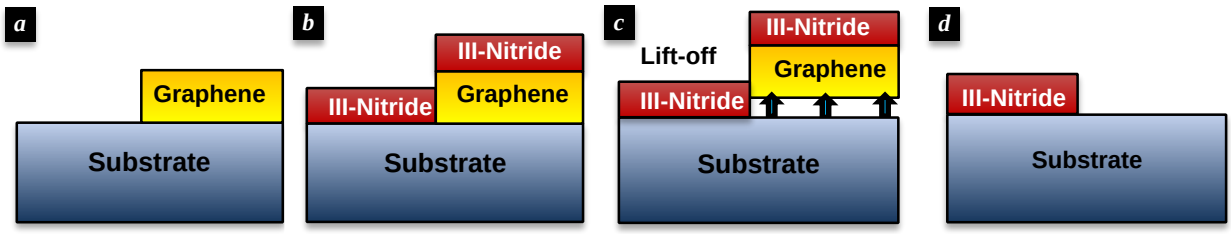

Figure 1. Schematic illustration of graphene-assisted lift-off technique for area-selective ALD of III-nitride thin films: (a) Graphene transfer on Si substrate; (b) III-nitride growth via PA-ALD; (c) lift-off process via ultra-sonication of III-nitride grown on graphene; (d) Si and III-nitride/Si interface after III-nitride/graphene lift-off process via sonication.

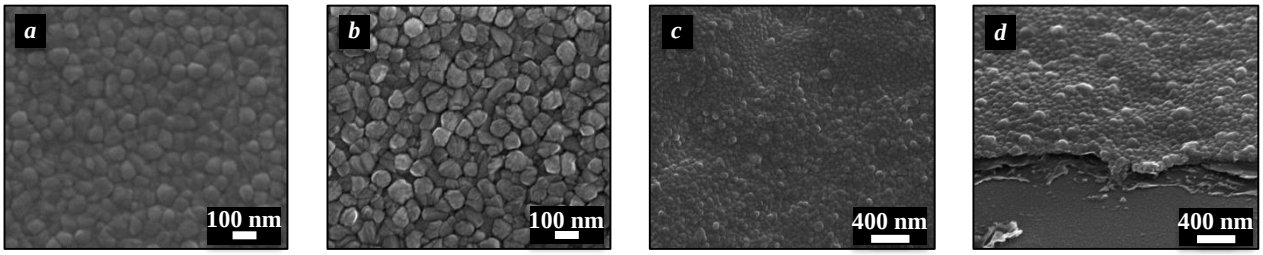

Figure 2. SEM images of (a) PA-ALD grown InN on Si; (b) InN/Si after ultrasonication; (c) InN/graphene/Si before lift-off sonication process; (d) interface between InN/Si and Si surface after InN/graphene lift-off process via sonication.