Electronic Supplementary Material (ESI) for RSC Advances


# Supporting Information for

# Key Growth Parameters Affecting the Domain Structure of Chemical Vapor Deposition (CVD)-Grown Graphene on Nickel

Seon Joon Kim, Dae Woo Kim, Hee-Tae Jung

National Research Laboratory for Organic Opto-Electronic Materials, Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon 305-701, Korea

## 1 Figures

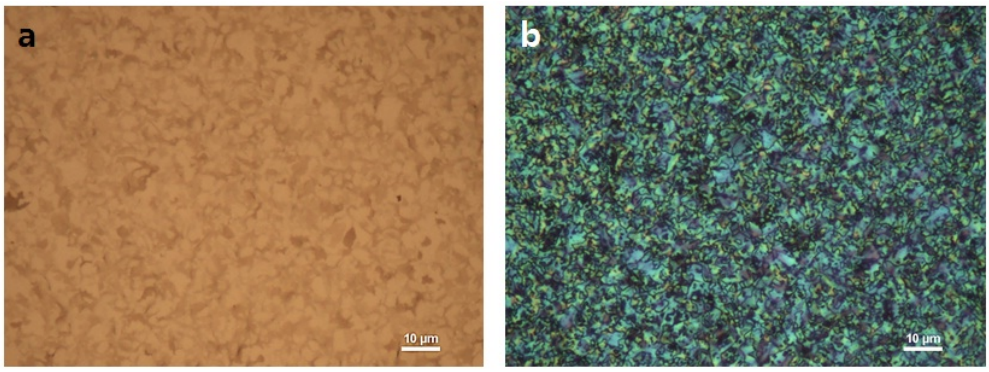


**Figure S1.** Optical images of graphene grown on a 400nm thick Ni thin film. (a) Optical microscopy image, (b) Polarized optical microscopy image of graphene coated with liquid crystal. Domain sizes of graphene are below 1 um.

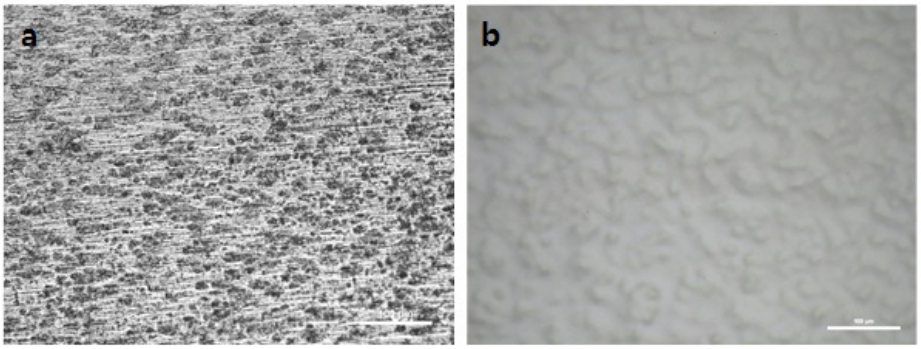


**Figure S2.** Optical images of Ni foil surfaces (a) before polishing, (b) after electrochemical polishing. Ridged surface features disappear to give a smooth surface after polishing.

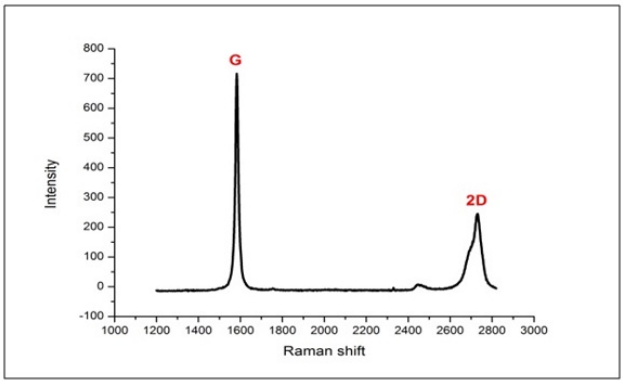


**Figure S3.** Raman spectroscopy of graphene sample used in all experiments. Typical peaks for highly thick graphene (nearly graphite) are observed; G peak at 1583cm$^{-1}$ and 2D peak at 2728cm$^{-1}$ with a shoulder peak. D peak is hardly observed in all samples.

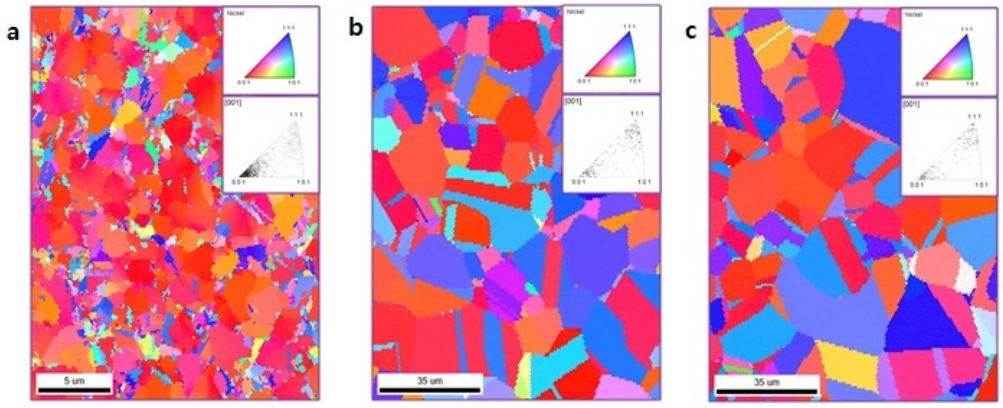


**Figure S4.** EBSD images for various Ni surfaces, (a) as-polished; (b) annealed at 1000 degrees for 1 h; (c) annealed at 1000 degrees for 3 h. Bottom inset images are inverse pole figures of each area indicating the dominant crystal grain orientation. Initial dominant orientation is Ni (001), areas of Ni (111) increase as annealing time increases. Grain sizes become larger as annealing time increases.

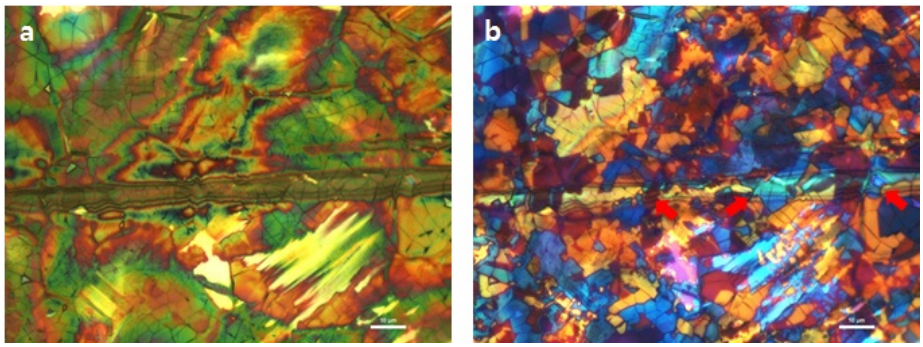


**Figure S5.** (a) Optical image of a curved-pit structure on a graphene sample. (b) Polarized optical microscopy (POM) image of liquid crystal coated graphene on the curved-pit. Liquid crystals are not confined inside the pit and align to graphene domains as indicated in areas marked by red arrows.

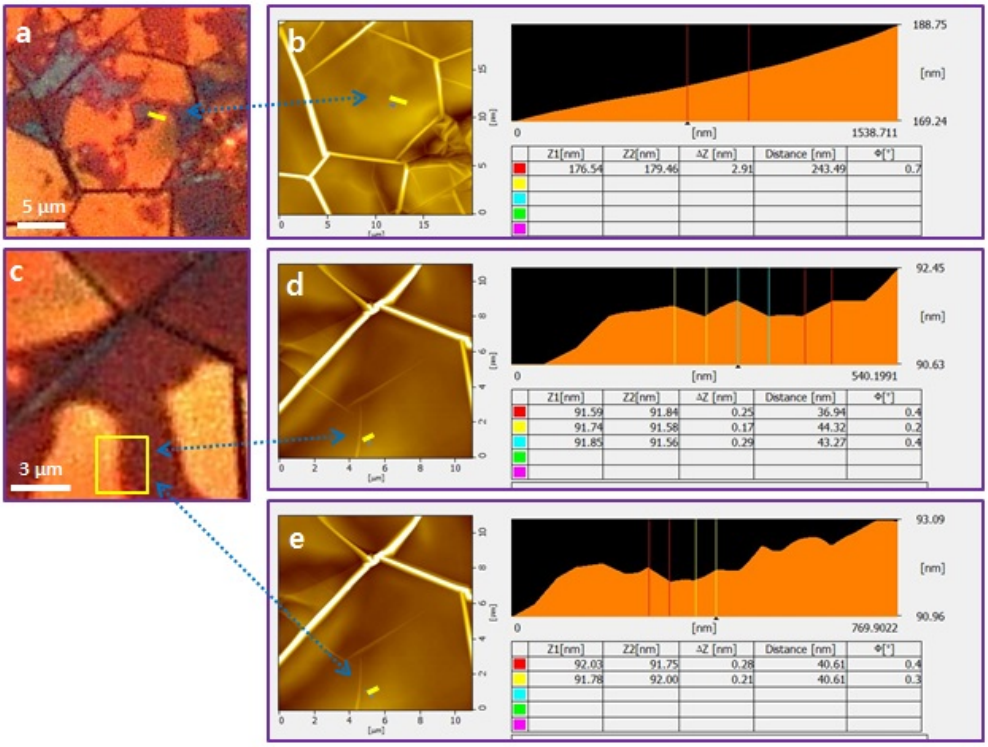


**Figure S6.** (a) Polarized optical microscopy (POM) image of liquid crystal coated graphene after exfoliation. (b) Height analysis of the area boundary indicated in (a) using atomic force microscopy (AFM). (c) POM image of a second area of liquid crystal coated graphene. (d, e) Height analysis of the area boundary indicated in (c). Height differences (ΔZ) do not show graphene layer step features across boundaries, indicating a planar, non-stepped graphene surface.