## Supporting Information

# Surface Texture and Composition Influenced Graphene Growth by Chemical Vapour Deposition on Cu-Ni Alloys for Field Emission Application

Gurjinder Kaur[1], Vijayesh Kumar[2†], Nitish Bibhanshu[3#], K.S. Suresh[4*], Indranil Lahiri[1,2*]

[1]Nanomaterials and Applications Lab, Department of Metallurgical and Materials Engineering, Indian Institute of Technology Roorkee, India.

[2]Centre of Excellence: Nanotechnology, Indian Institute of Technology Roorkee, India.

[3]Department of Materials Engineering, Indian Institute of Science Bangalore, India.

[4]Department of Metallurgical and Materials Engineering, Indian Institute of Technology Roorkee, India.

[†]Present address: Ubiquitous Analytical Techniques (H1), Central Scientific Instruments Organization (CSIO), a constituent unit of Council of Scientific & Industrial Research (CSIR), Chandigarh.

[#]Present address: Nuclear Science and Engineering Directorate, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA.

*** Corresponding Authors**

K.S. Suresh, E mail– ks.suresh@mt.iitr.ac.in

and

Indranil Lahiri, E-mail– indranil.lahiri@mt.iitr.ac.in

## Contents of supporting information

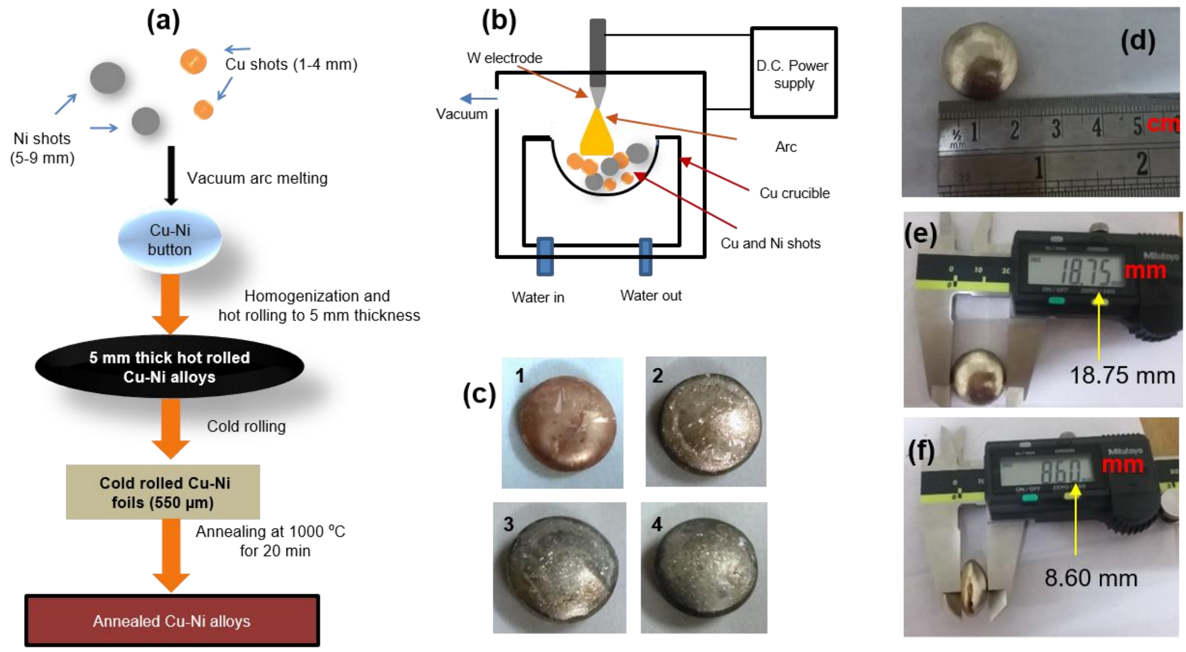


**Figure S1:** (a) Overall schematics of the preparation of Cu-Ni alloy foils. (b) Simplified schematics of vacuum arc melting system. (c) Digital images of prepared Cu-Ni alloy buttons: 1, 2, 3 and 4 corresponds to buttons of compositions 100Cu-0Ni, 84.65Cu-15.35Ni, 72.6Cu-27.4Ni and 63Cu-37Ni, respectively. (d), (e) and (f) show the dimensions of prepared Cu-Ni button.

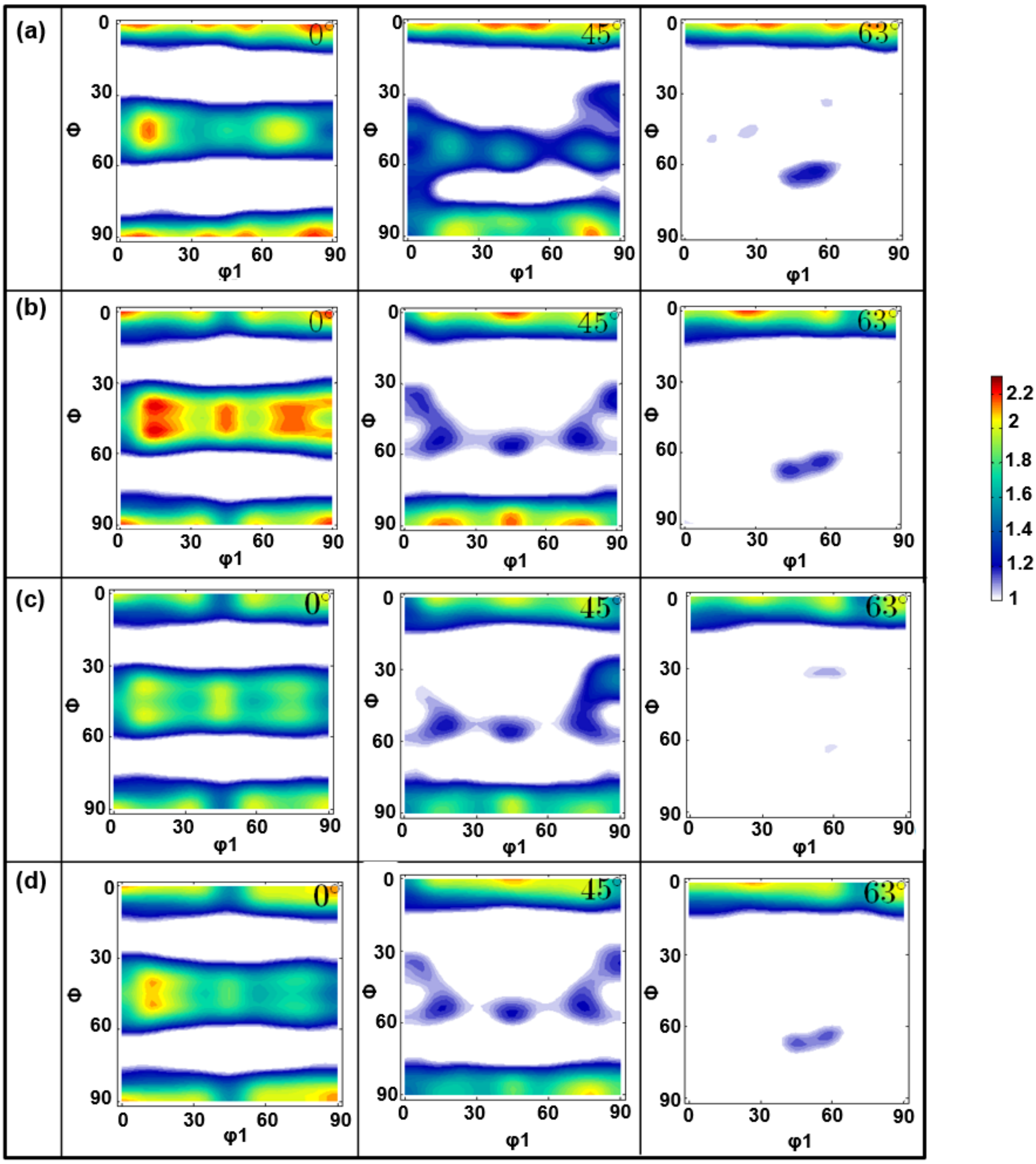


**Figure S2.** φ2 = 0°, 45° and 63° sections of the ODFs for the Cu-Ni alloys in hot rolled state: (a) 100Cu-0Ni, (b) 84.65Cu-15.35Ni, (c) 72.6Cu-27.4Ni and (d) 63Cu-37Ni (measured by XRD).

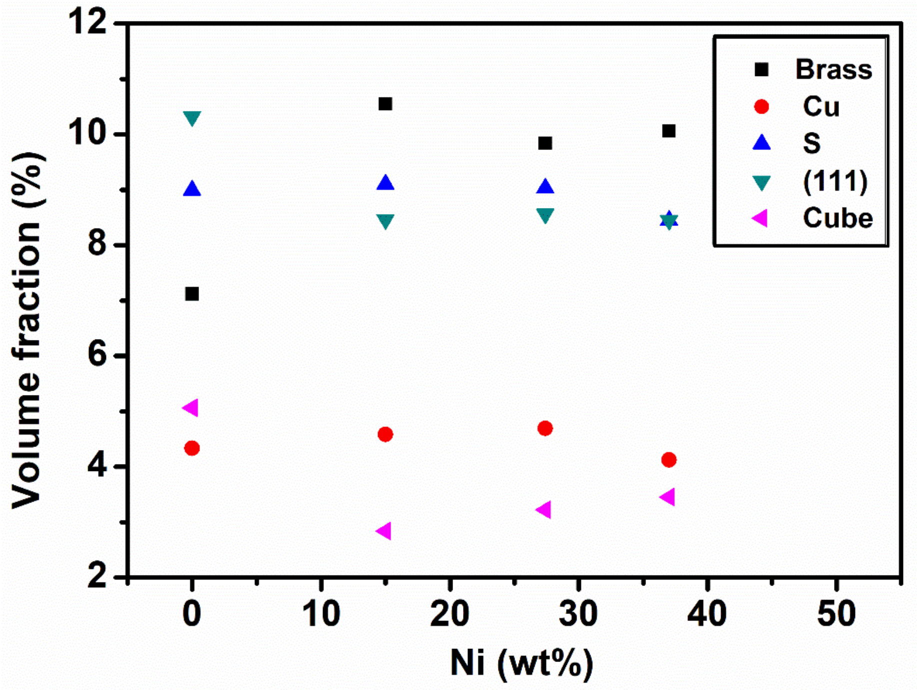


**Figure S3**. Effect of Ni content on volume fraction of different texture components for hot rolled samples.

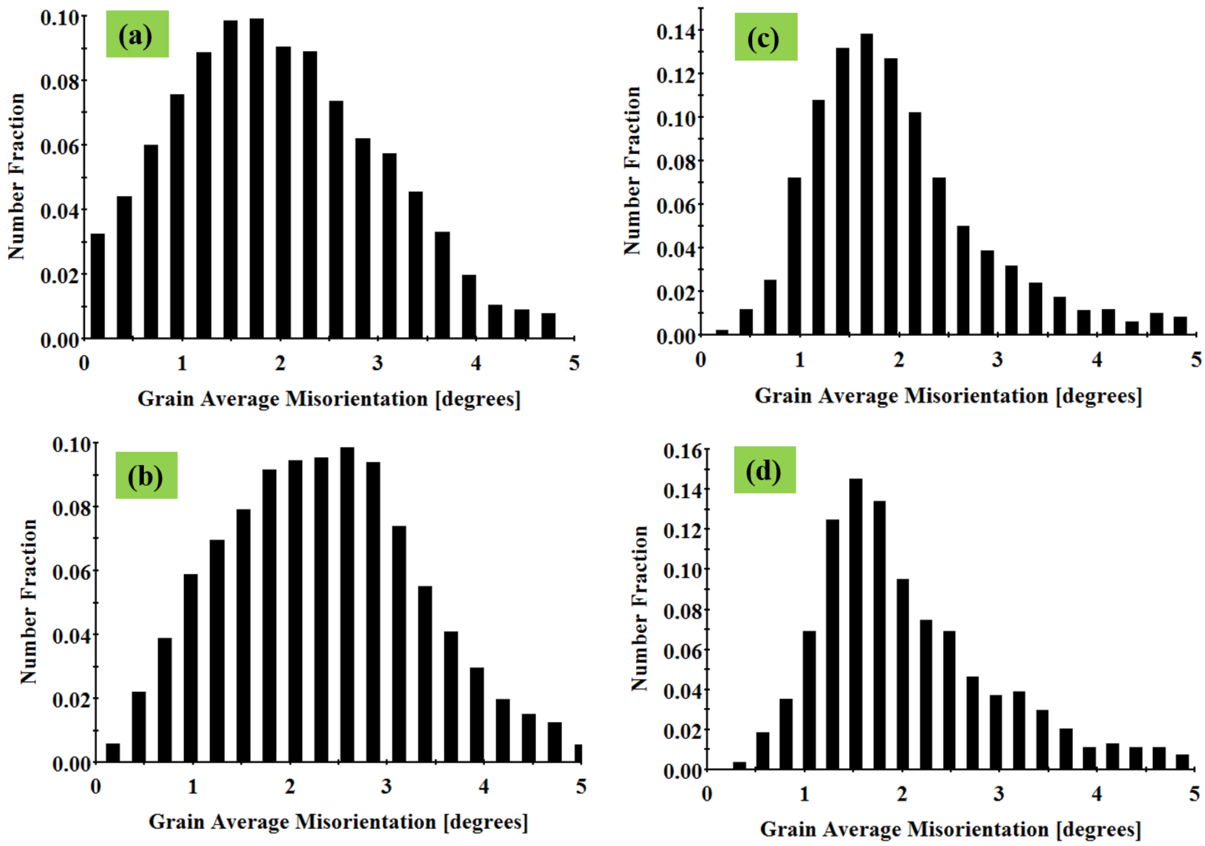


**Figure S4.** Grain average misorientation charts of Cu-Ni alloys in cold rolled state (90% deformation); (a) 100Cu-0Ni, (b) 84.5Cu-15.35Ni, (c) 72.6Cu-27.4Ni and (d) 63Cu-37Ni.

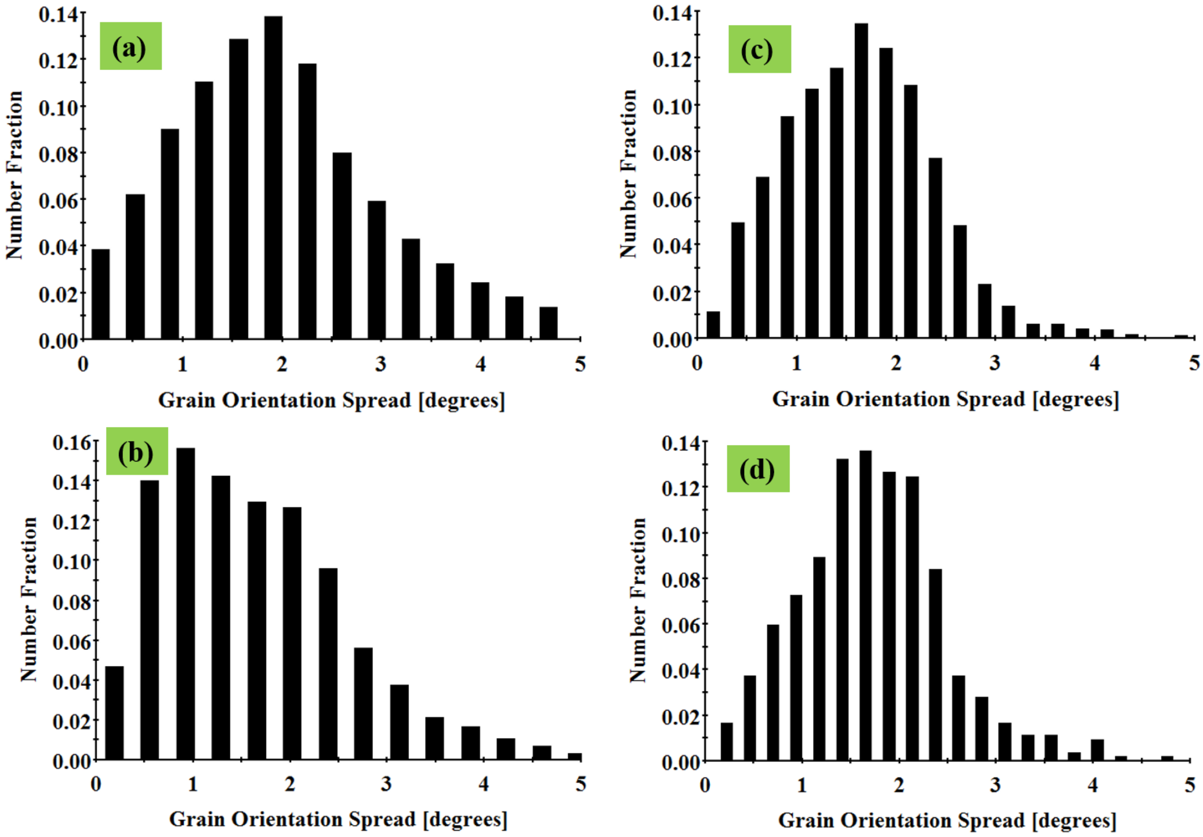


**Figure S5.** Grain orientation spread charts of Cu-Ni alloys in cold rolled state (90% deformation); (a) 100Cu-0Ni, (b) 84.5Cu-15.35Ni, (c) 72.6Cu-27.4Ni and (d) 63Cu-37Ni.

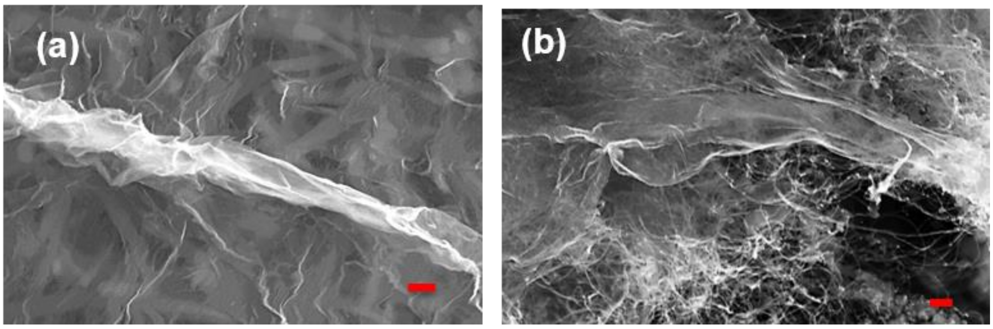


**Figure S6.** FESEM images of graphene transferred from 63Cu-37Ni alloy on (a) CuO nanorods and (b) CNTs. Scale bar in both images is 400 nm.

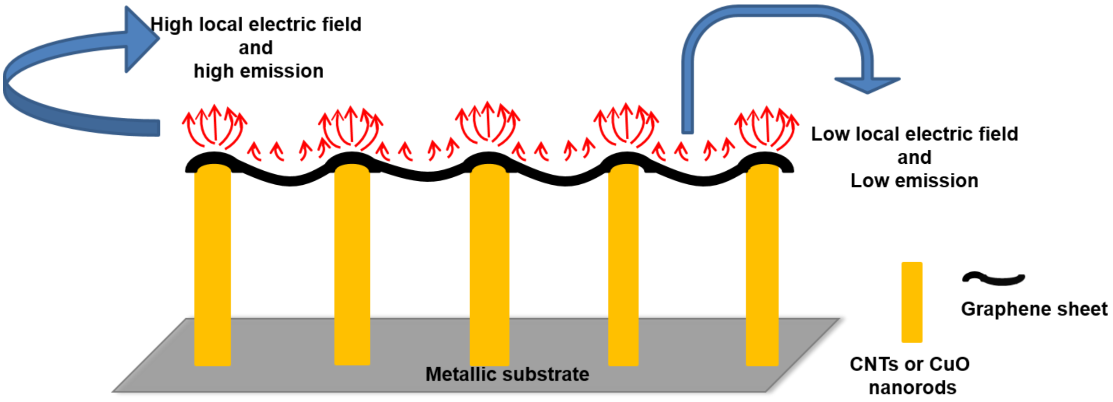


**Figure S7.** Schematic model of field emission from the hybrid structures prepared by transfer of graphene on CNTs or CuO nanorods.

**Table S1.** Ratio of brass component of rolled samples to brass component of annealed samples Bs(R)/Bs(A) and ratio of S component of rolled samples to S component of annealed samples S(R)/S(A).

| Samples | Bs(R)/Bs(A) | S(R)/S(A) |
|---|---|---|
| 100Cu-0Ni, | 1.42 | 1.23 |
| 84.5Cu-15.35Ni | 1.47 | 1.83 |
| 72.6Cu-27.4Ni | 1.84 | 2.22 |
| 63Cu-37Ni. | 1.83 | 2.09 |