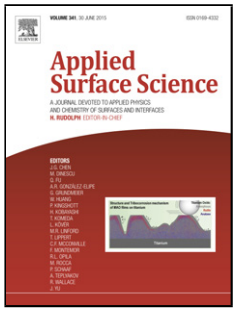

Title: Probing local work function of electron emitting Si-nanofacets

Author: <ce:author id="aut0005" author-id="S0169433217300284-f101edadf98458dcc69bd25c2057f56f"> Tanmoy Basu<ce:author id="aut0010" author-id="S0169433217300284-71fdca5efd37691508e028c24d903cc8"> Tapobrata Som

PII: S0169-4332(17)30028-4
DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2017.01.028
Reference: APSUSC 34823

To appear in: *APSUSC*

Received date: 15-10-2016
Revised date: 28-12-2016
Accepted date: 4-1-2017

Please cite this article as: Tanmoy Basu, Tapobrata Som, Probing local work function of electron emitting Si-nanofacets, Applied Surface Science http://dx.doi.org/10.1016/j.apsusc.2017.01.028

Highlights

- The present report demonstrates tunable field emission at room temperature from ion-beam fabricated Si-NFs. It is observed that the field emission from the nanofacets are quite stable and the FE process is governed by Fowler-Nordheim tunnelling.
- Si-NFs offer a very low turn-on field and a high enhancement factor at the lowest ion exposure time. It is observed that the value of the turn-on field increases and the enhancement factor decreases with increasing ion exposure time.
- We demonstrate a spatial variation in the work function map of the Si-NF arrays using Kelvin probe force microscopy. The observed higher value of the work function at the apexes than sidewalls should lead to suppression of electron emission.
- Inhomogeneous oxidation of Si nanostructures and their different crystallographic orientations can be attributed to be the two main factors to cause the spatial variation in