

Direct Synthesis of Electrowettable Nanostructured Hybrid Diamond

Sujit Deshmukh^{a,b}, Kamatchi Jothiramalingam Sankaran^{c,d}, Debosmita Banerjee^a, Chien-Jui Yeh^e, Key-Chyang Leou^e, Deodatta Maheshwar Phase^f, Mukul Gupta^f, I-Nan Lin^g, Ken Haenen^{c,d}, Susanta Sinha Roy^{a*}, Prashant. R. Waghmare^{b*}

^aDepartment of Physics, School of Natural Sciences, Shiv Nadar University, NH-91, Uttar Pradesh 201314, India.

^b *interfacial* Science and Surface Engineering Lab (*iSSELab*), Department of Mechanical Engineering, University of Alberta, Edmonton, Alberta T6G2G8, Canada

^cInstitute for Materials Research (IMO), Hasselt University, Diepenbeek, Belgium.

^dIMOMEC, IMEC vzw, Diepenbeek, Belgium.

^eDepartment of Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan, Republic of China.

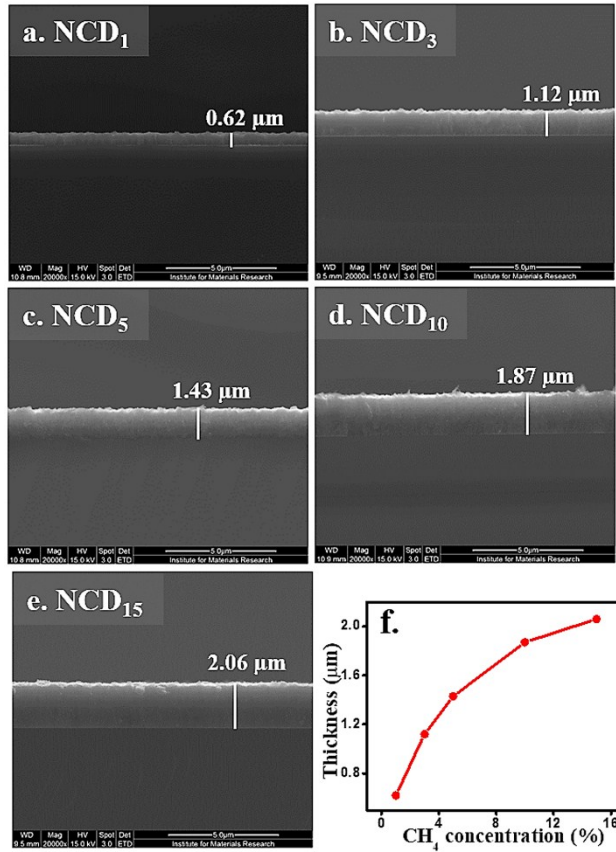
^fUGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore 452017, India.

^gDepartment of Physics, Tamkang University, Tamsui, Taiwan, Republic of China.

*Corresponding authors

Email addresses: susantaroy69@gmail.com and waghmare@ualberta.ca

The thickness of the NCD films are measured using cross sectional SEM micrographs and plotted against CH₄ concentration in Figure S1. A general rising trend of film thickness with increasing



CH₄ concentration is noticed.

Figure S1 Cross sectional SEM images of NCD films grown by (a) 1% (b) 3% (c) 5% (d) 10% and (e) 15% CH₄ concentration. (f) Plot of film thickness as a function of CH₄ concentration.

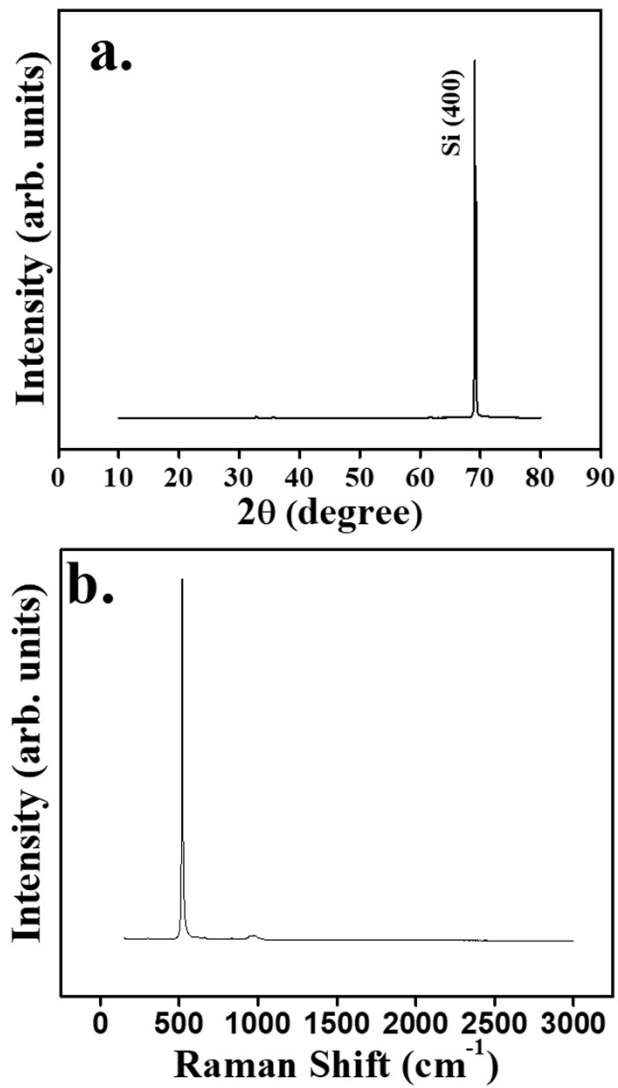


Figure S2(a) XRD and (b) Raman spectrum of Si (100) substrate.

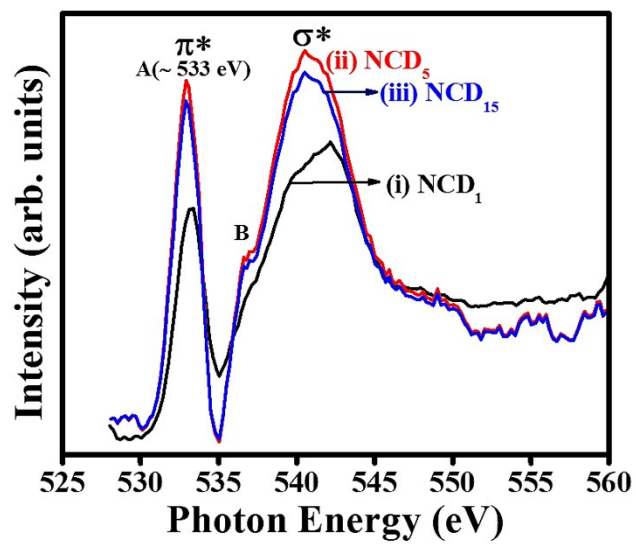


Figure S3 Normalized O-K edge XANES spectra of (i) NCD₁ (ii) NCD₅ and (iii) NCD₁₅.