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Supplementary Information

Application of Microwave Synthesized Ultra-smooth a-C Thin Film for the Reduction of Dielectric/Semiconductor Interface Trap States of an Oxide Thin Film Transistor

Nila Pal[a], Baishali Thakurta[b], Rajarshi Chakraborty[a], Utkarsh Pandey[a], Vishwas Acharya[a], Sajal Biring[c], Monalisa Pal[b*], and Bhola N. Pal[a,c*]

[a]*School of Materials Science and Technology, Indian Institute of Technology (Banaras Hindu University), Varanasi-221005, India*

[b]*Department of Chemistry, Banaras Hindu University, Varanasi-221005, India*

[c]*Organic Electronics Research Center and Department of Electronic Engineering, Ming-Chi University of Technology, New Taipei City, Taiwan 243*

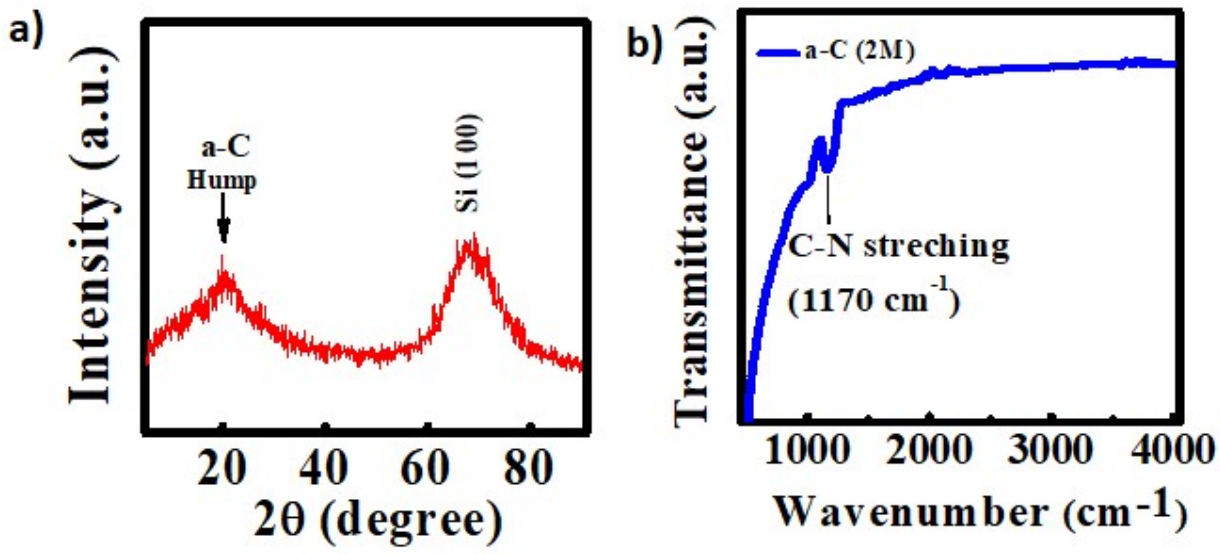

Figure S 1a) XRD pattern, b) FTIR spectra of a-C thin film on p^{++}-Si substrate.

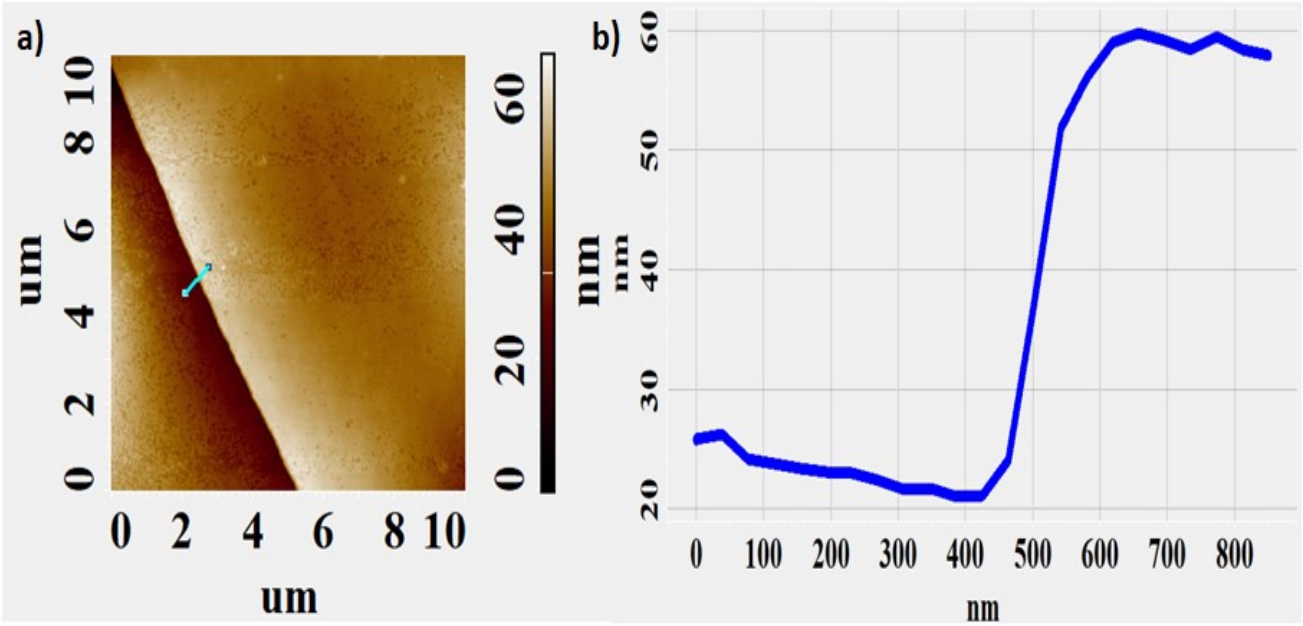

Figure S 2a) AFM image, b) height profile of a-C thin film on p^{++}-Si substrate

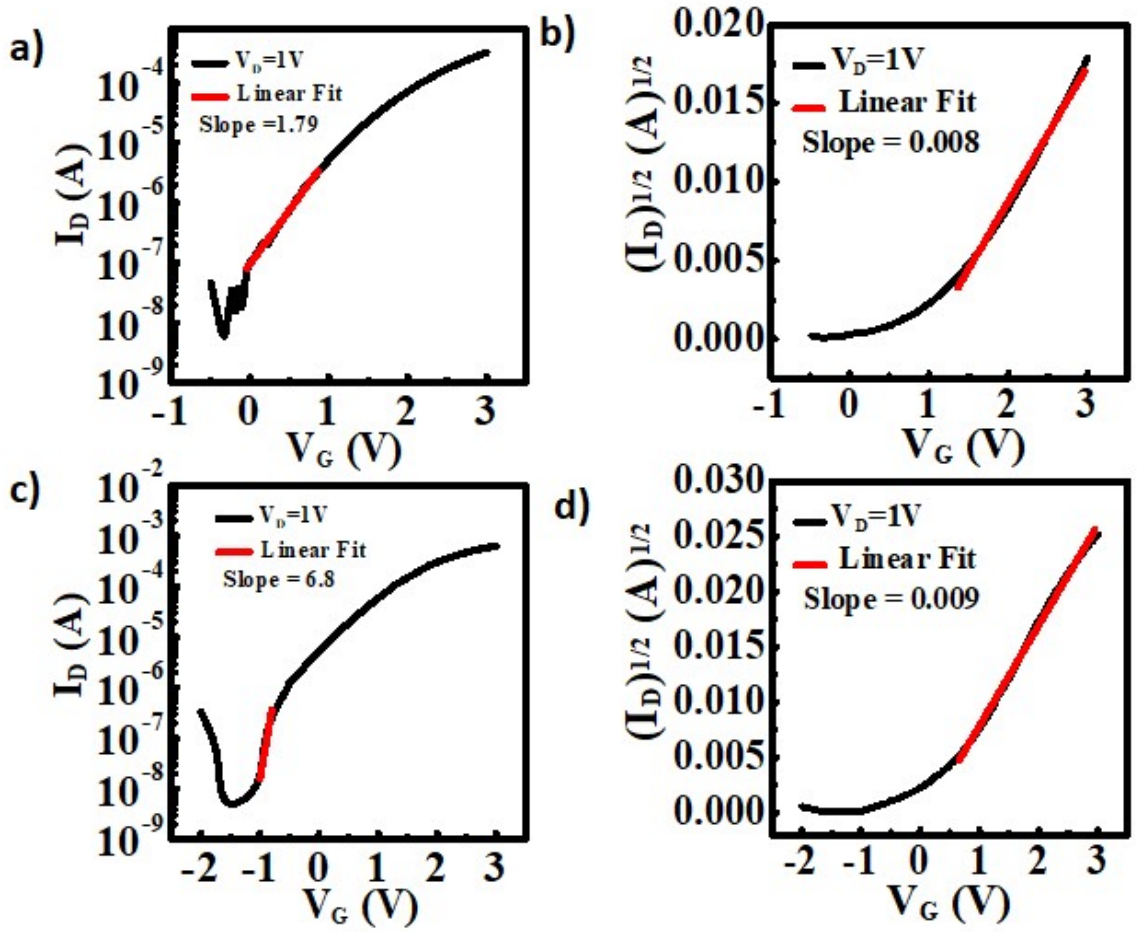

Figure S 3 Linear fitting at lower region of log (I_D) vs. V_G curves of a) device-1, c) device-2 for Subthreshold Swing value calculation. Linear fitting of $(I_D)^{1/2}$ vs. V_G curve of b) device-1, and d) device-2 to extract the slope for mobility calculation.

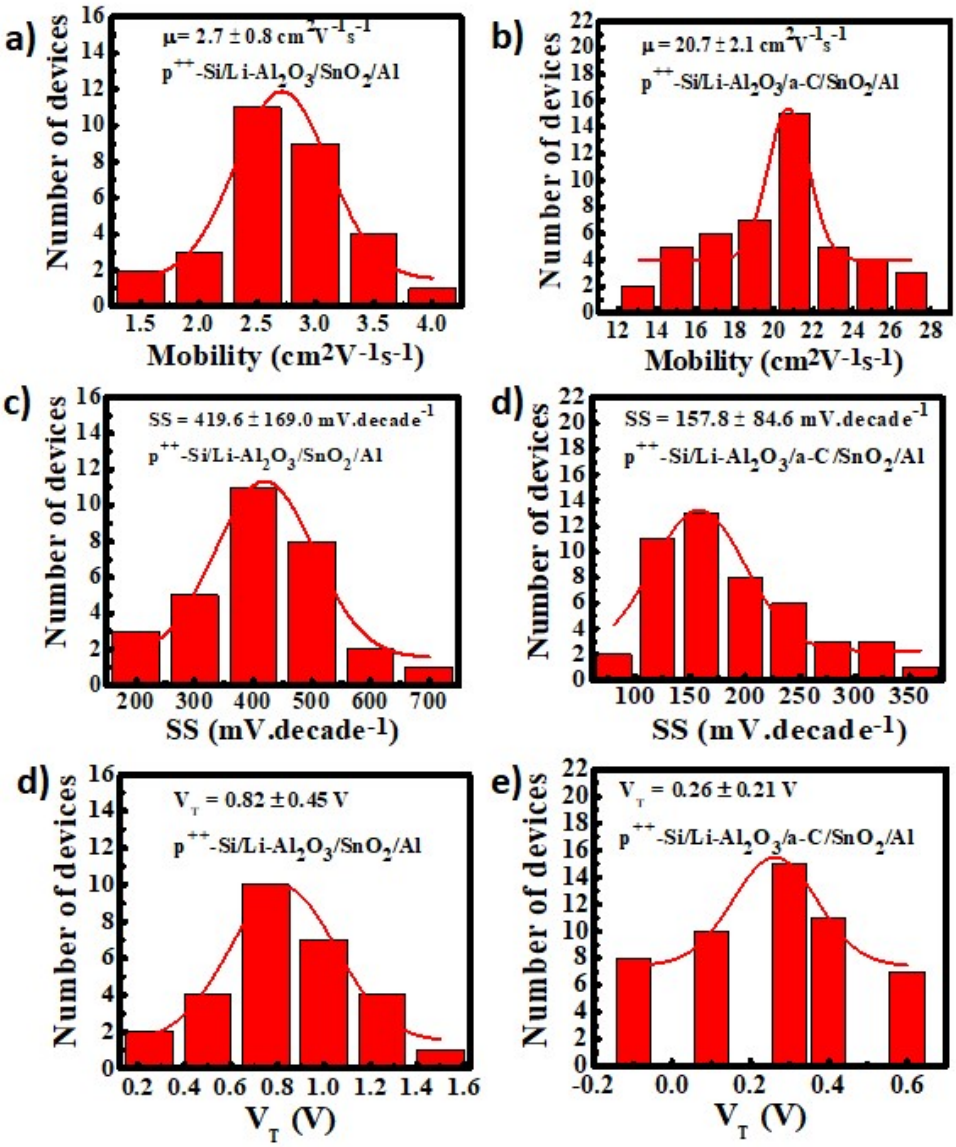

Figure S 4Histogram of Li-Al_2O_3 gate dielectric(w and w/o a-C interface) TFT a) number of devices tested with mobility for device-1 b) number of devices tested with mobility for device-1c) number of devices tested vs. SS value of the device-1 d) number of devices tested vs. SS value of the device-2 e) number of devices tested vs. V_T of the device-1 f) number of devices tested vs. V_T of the device-1

Table S1: Statistical values of device parameters

Device	**Threshold Voltage (V)**	**Subthreshold Swing ($mV.decade^{-1}$)**	**Saturation Mobility ($cm^2.V^{-1}.s^{-1}$)**
p^{++}-Si/Li-Al_2O_3/SnO_2/Al	0.82 ± 0.45	419.6 ± 169.0	2.7 ± 0.8
p^{++}-Si/ Li-Al_2O_3/a-C/SnO_2/Al	0.26 ± 0.21	157.8 ± 84.6	20.7 ± 2.1