Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.
This journal is © The Royal Society of Chemistry 2022

Electronic Supplementary Information

Facet-dependent electrical conductivity properties of 4H-SiC wafer

Gautam Kumar, Jing-Wei Chen, Hsueh-Heng Ma, Xing-Fu Huang and Michael H. Huang*

Department of Chemistry and Frontier Research Center on Fundamental and Applied Sciences of Matters, National Tsing Hua University, Hsinchu 300044, Taiwan

Probe preparation

The tungsten probes were fabricated from 99.95% tungsten wires with a diameter of 0.5 mm (Strem Chemical). The tungsten wires were straightened and cut into pieces. Next, the wires were dipped into a 2.0 M NaOH electrolyte solution and a current of 1 A at a voltage of 15 V was applied to sharpen the tips. The tips should be sequentially immersed into a 10 M KOH solution and deionized water for 3 sec each. This procedure could remove the surface tungsten oxide layer and any ions from the tip surface. The tip diameter is 100–200 nm.

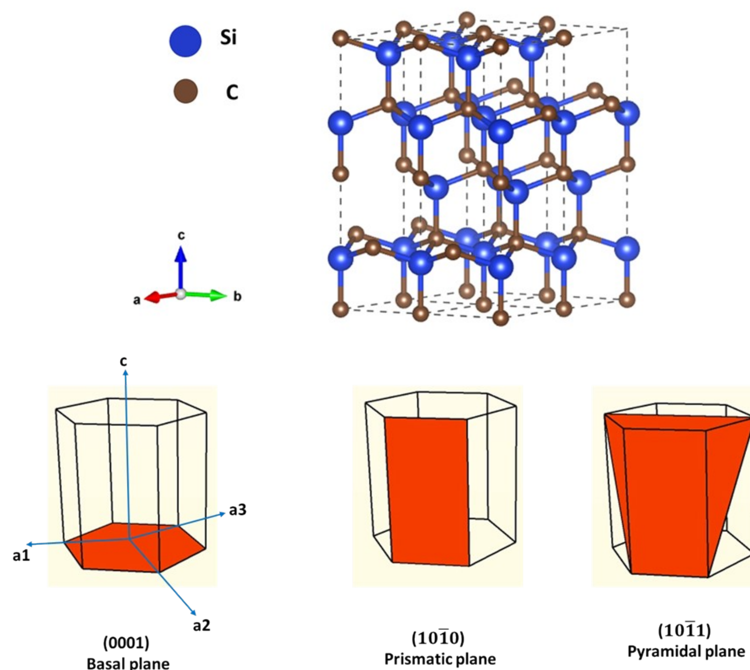

Fig. S1 Wurtzite crystal structure of 4H-SiC and its different planes.

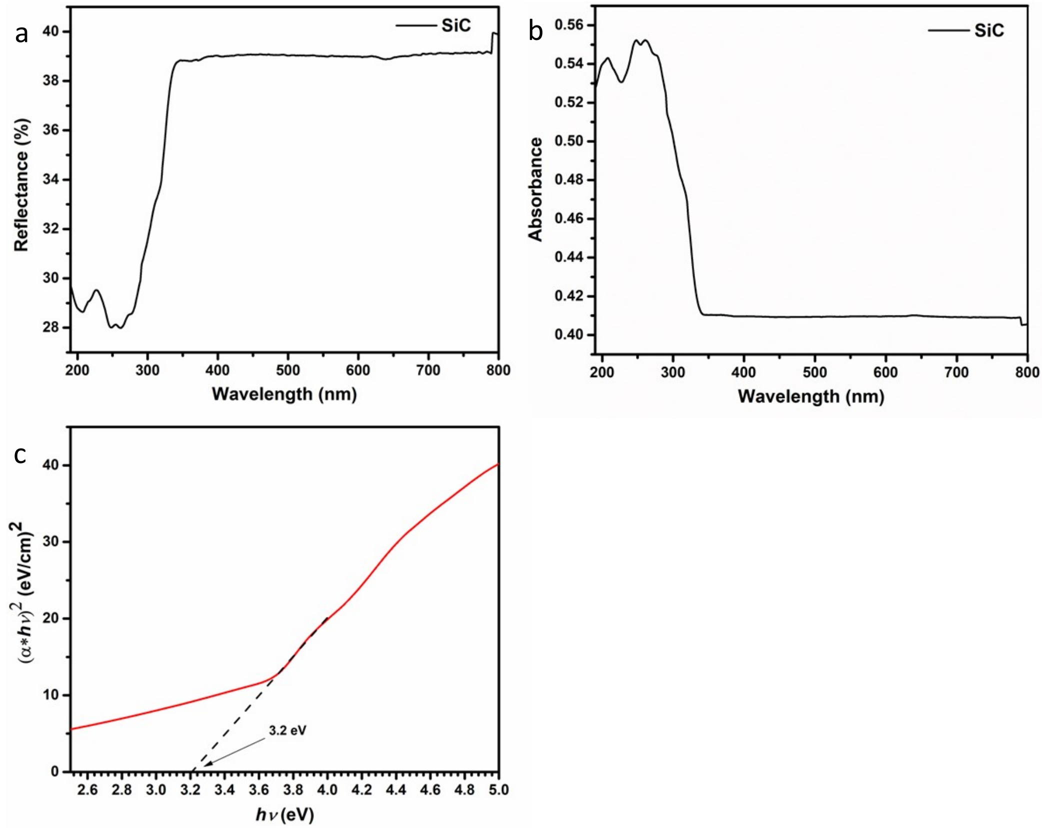

Fig. S2 (a, b) Diffuse reflectance spectrum and the converted absorption spectrum of 4H-SiC wafer. (c) Tauc plot for the determination of SiC band gap.

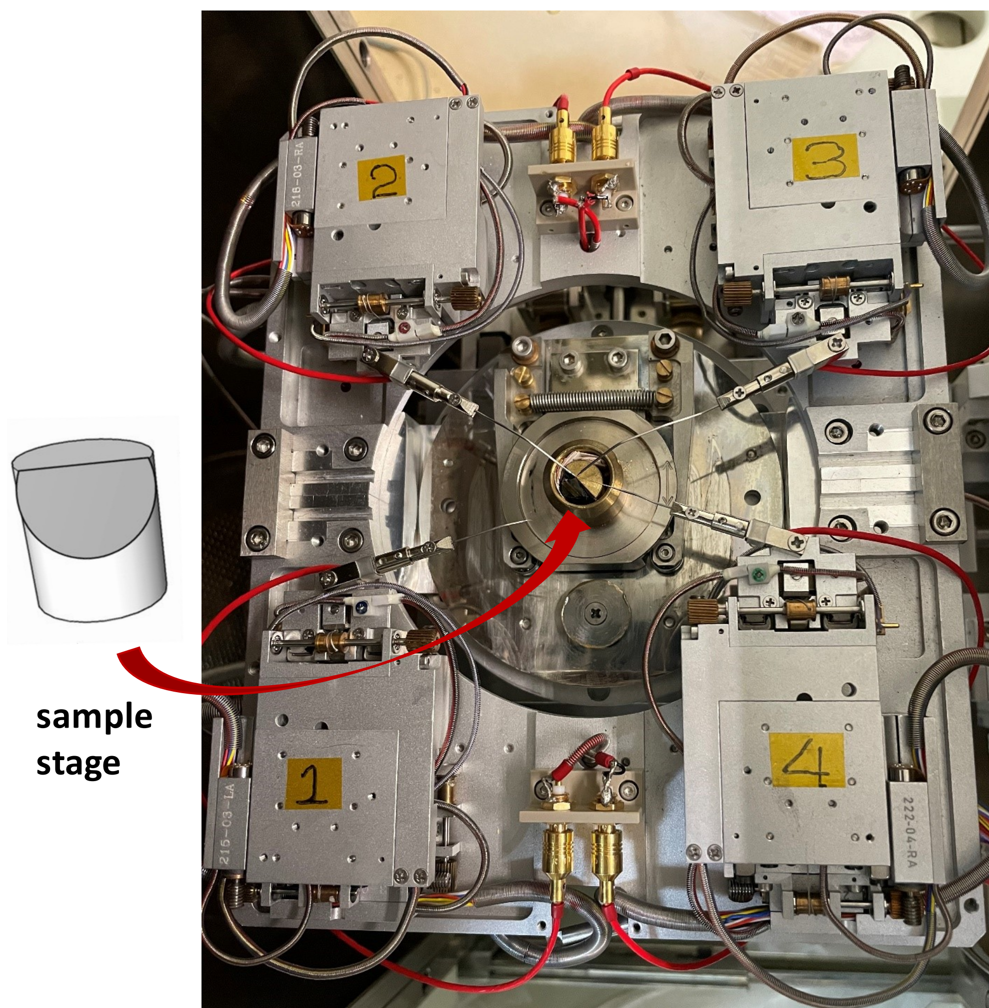

Fig. S3 Photograph of the nanomanipulator and a drawing of the sample stage showing the slanted side.

Fig. S4 (a–e) Multiple *I–V* curves for different probe contact combinations on a 4H-SiC wafer.

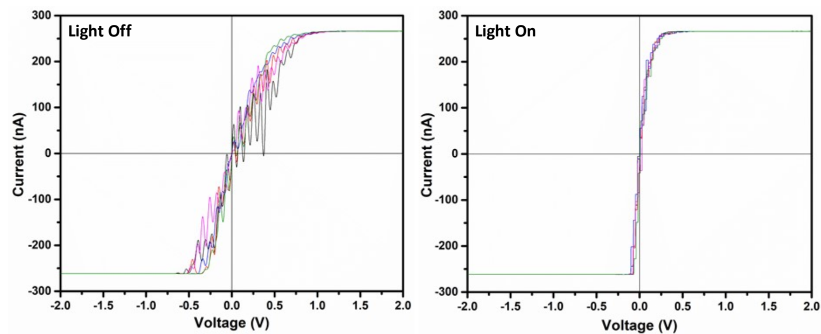

Fig. S5 Multiple I–V curves obtained using a conductive AFM probe on a 4H-SiC wafer with and without LED light illumination.