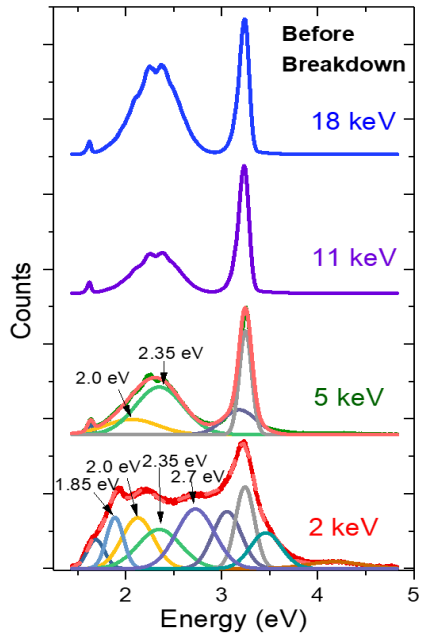


Fig. 1. DRCLS spectra at 2keV, 5 keV, 11 keV, and 18 keV, (R_B:50 nm, 190 nm, 680 nm, 1600 nm, respectively) before breakdown.

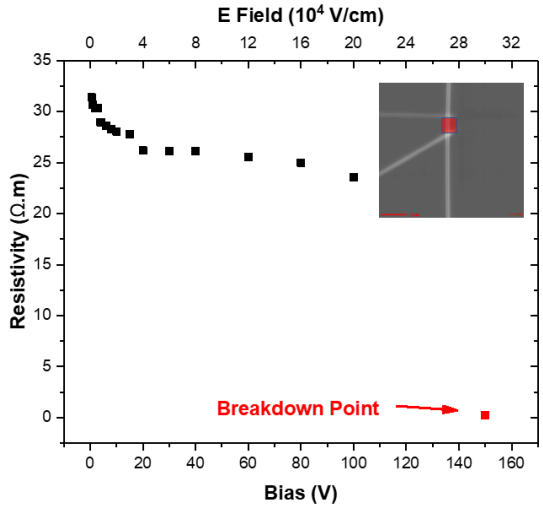


Fig. 2. Resistivity vs. applied voltage (electric field). Dielectric breakdown took place at 150V (300kV/cm). Insert figure shows the SEM image of the microwire bias setting

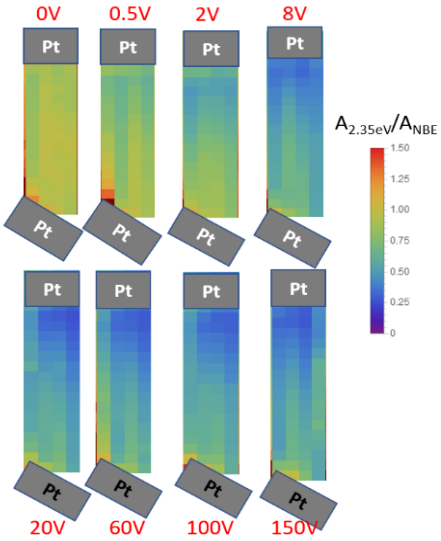


Fig. 3. HSI maps of $A_{2.35eV}/A_{NBE}$ at E_B=7 keV (R_B=320 nm) in region between contacts of the microwire at different applied bias.

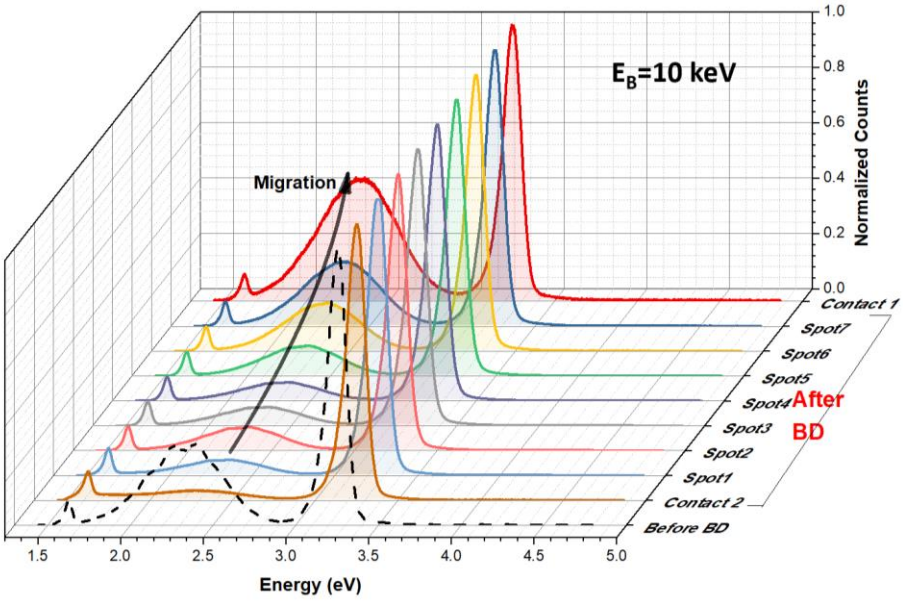


Fig. 4. DRCLS spectra taken at E_B=10 keV (R_B=600 nm) on different spots through contacts and between contacts after breakdown compared with before breakdown.

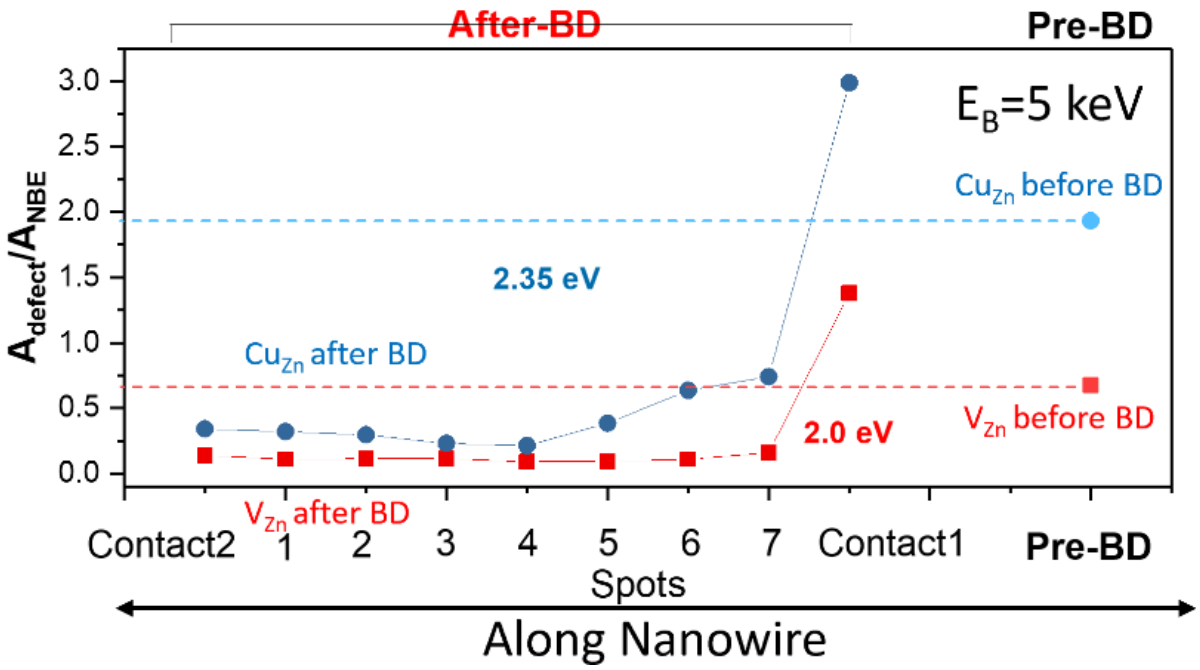
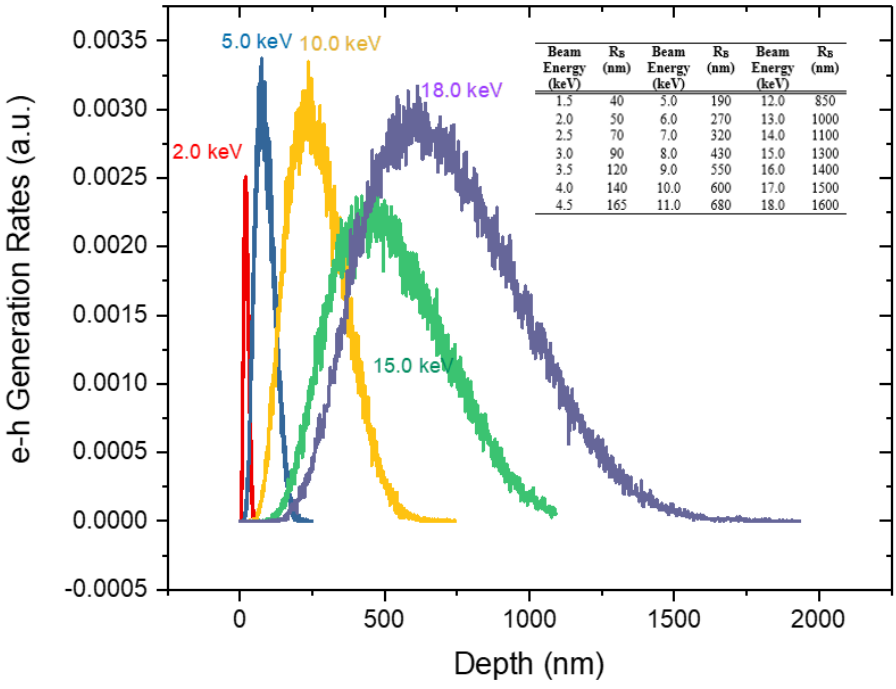


Fig. 5. Deconvolved areas of 2.0 eV (V_{Zn} cluster) and 2.35 eV (Cu_{Zn}) normalized by the NBE area at different spots through contacts and between contacts after breakdown compared with before breakdown. For E_B=5 keV, R_B=190 nm without Pt contact. Average concentrations are 17% and 15% of before breakdown, respectively



Beam Energy (keV)	R_B (nm)	Beam Energy (keV)	R_B (nm)	Beam Energy (keV)	R_B (nm)
1.5	40	5.0	190	12.0	850
2.0	50	6.0	270	13.0	1000
2.5	70	7.0	320	14.0	1100
3.0	90	8.0	430	15.0	1300
3.5	120	9.0	550	16.0	1400
4.0	140	10.0	600	17.0	1500
4.5	165	11.0	680	18.0	1600

Fig. 6. ZnO Monte Carlo excitation rates vs. depth for beam energies E_B =1.5-18.0 keV for controllable depth R_B<50 to >1600 nm. Insert table shows the R_B vs E_B at each beam energy.