



Supporting Information

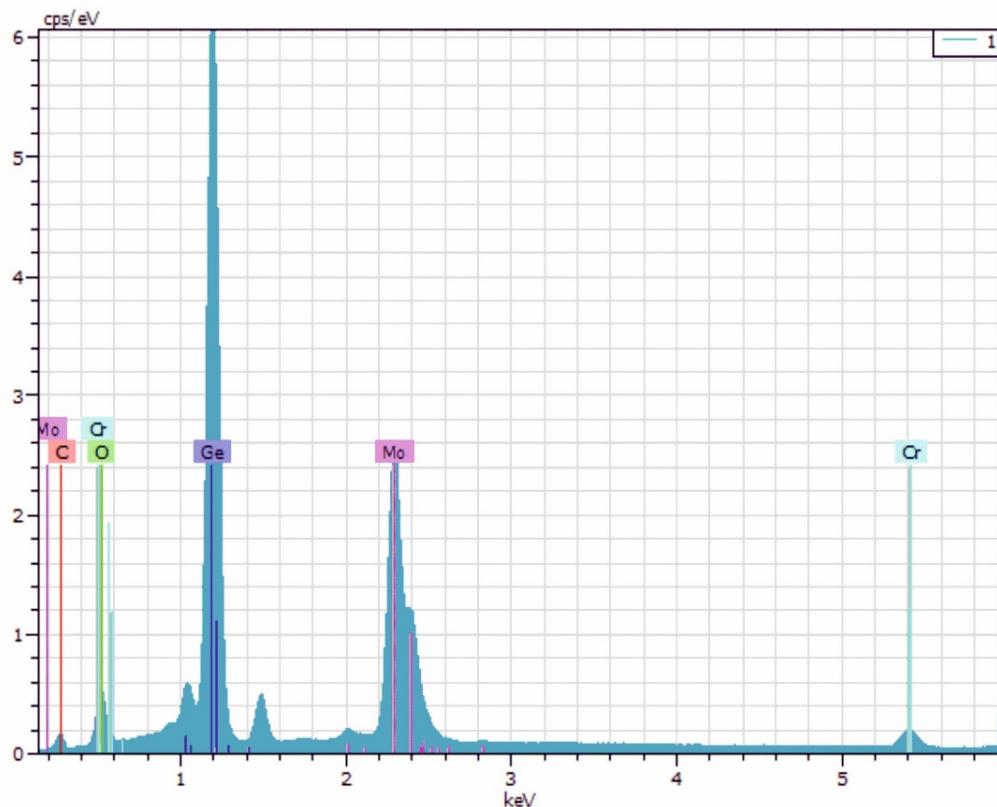
for

Chemical vapor deposition of germanium-rich CrGe_x nanowires

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Analysis of CrGe_x nanowires, experimental contacting for *I*–*V* characteristics, and scheme of CVD apparatus



El	AN	Series	unn.	C	norm.	C	Atom.	C	Error (1 Sigma)
			[wt. %]	[wt. %]	[at. %]			[wt. %]	
<hr/>									
C	6	K-series	6.52	5.59	22.55			0.93	
O	8	K-series	9.58	8.22	24.87			1.20	
Cr	24	K-series	3.48	2.99	2.78			0.13	
Ge	32	L-series	56.14	48.16	32.11			3.15	
Mo	42	L-series	40.85	35.04	17.68			1.45	
<hr/>									
Total: 116.59 100.00 100.00									

Figure S1: EDX analysis of a Cr/Ge deposit.

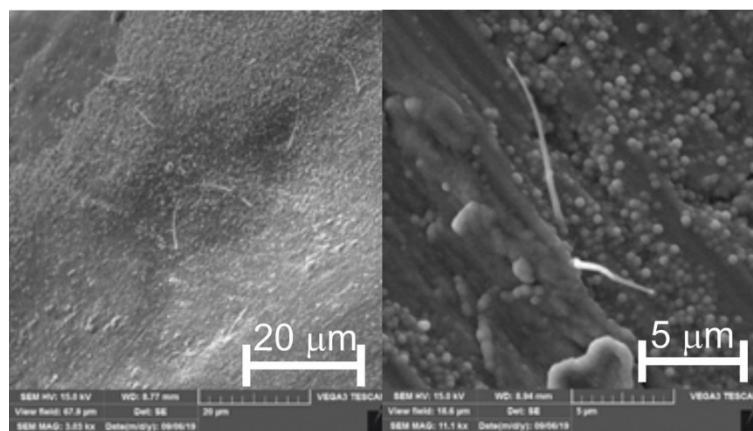


Figure S2: Tapered nanowires scarcely growing from a deposit.

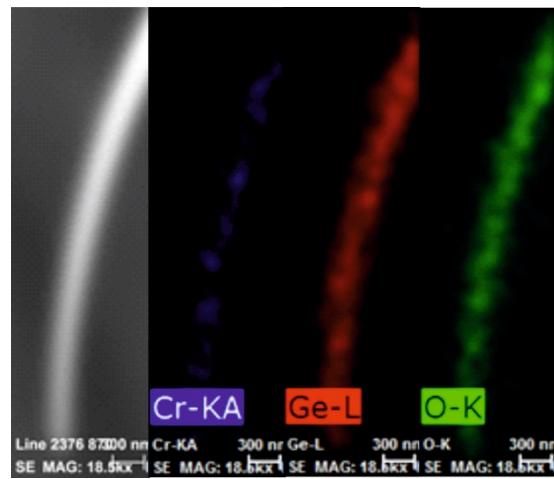


Figure S3: Elemental mapping of a single nanowire.

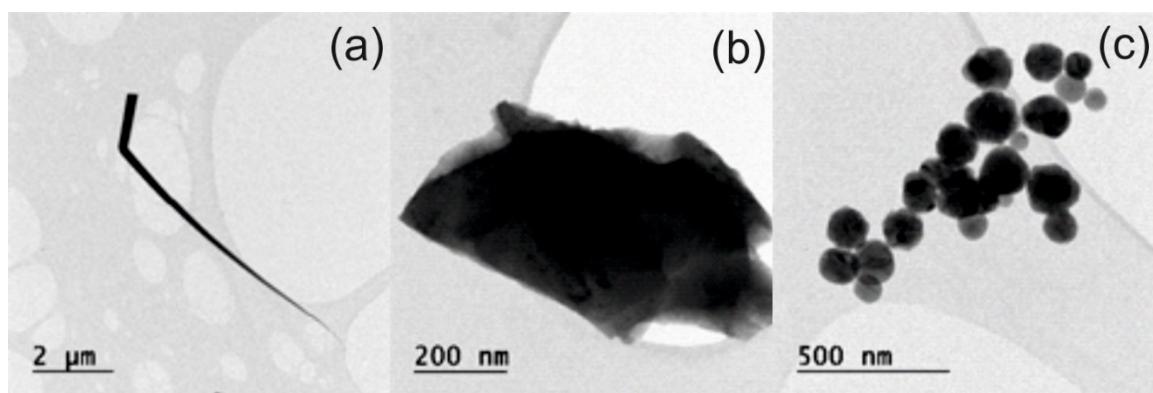


Figure S4: Nanoobjects observed during HRTEM analysis: (a) nanowires, (b) objects of an irregular shape, and (c) nanoballs.

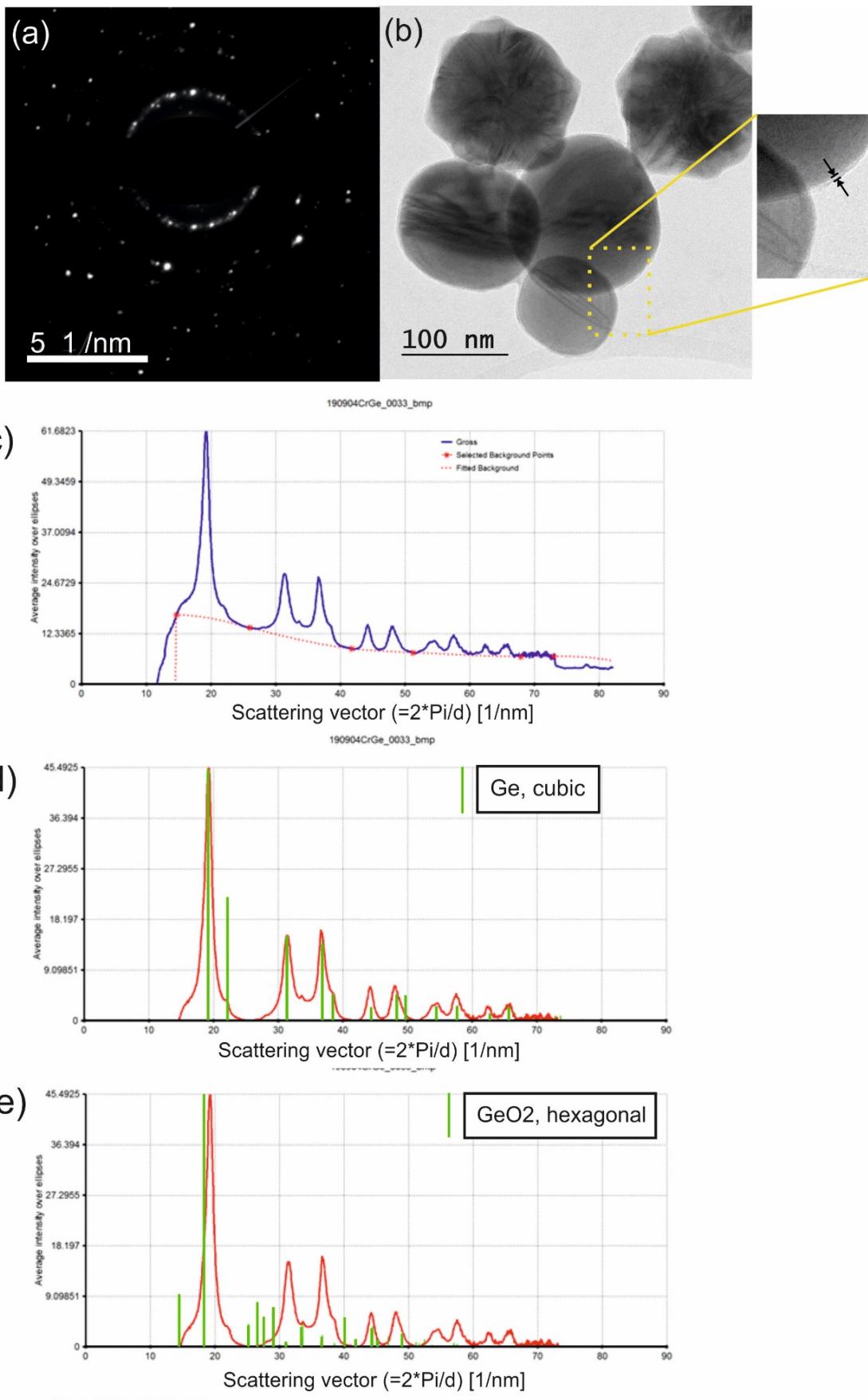


Figure S5: SAED analysis of nanoballs. (a) SAED image, (b) HRTEM photo with part of nanoballs magnified to make visible an oxidized layer (~5 nm) on the nanoball surface, (c) SAED image converted into an intensity diffractogram, before background subtraction, and (d) Ge cubic (PDF 65-9209) and (e) GeO₂ hexagonal (PDF 85-1515) markers in diffractogram after background subtraction.

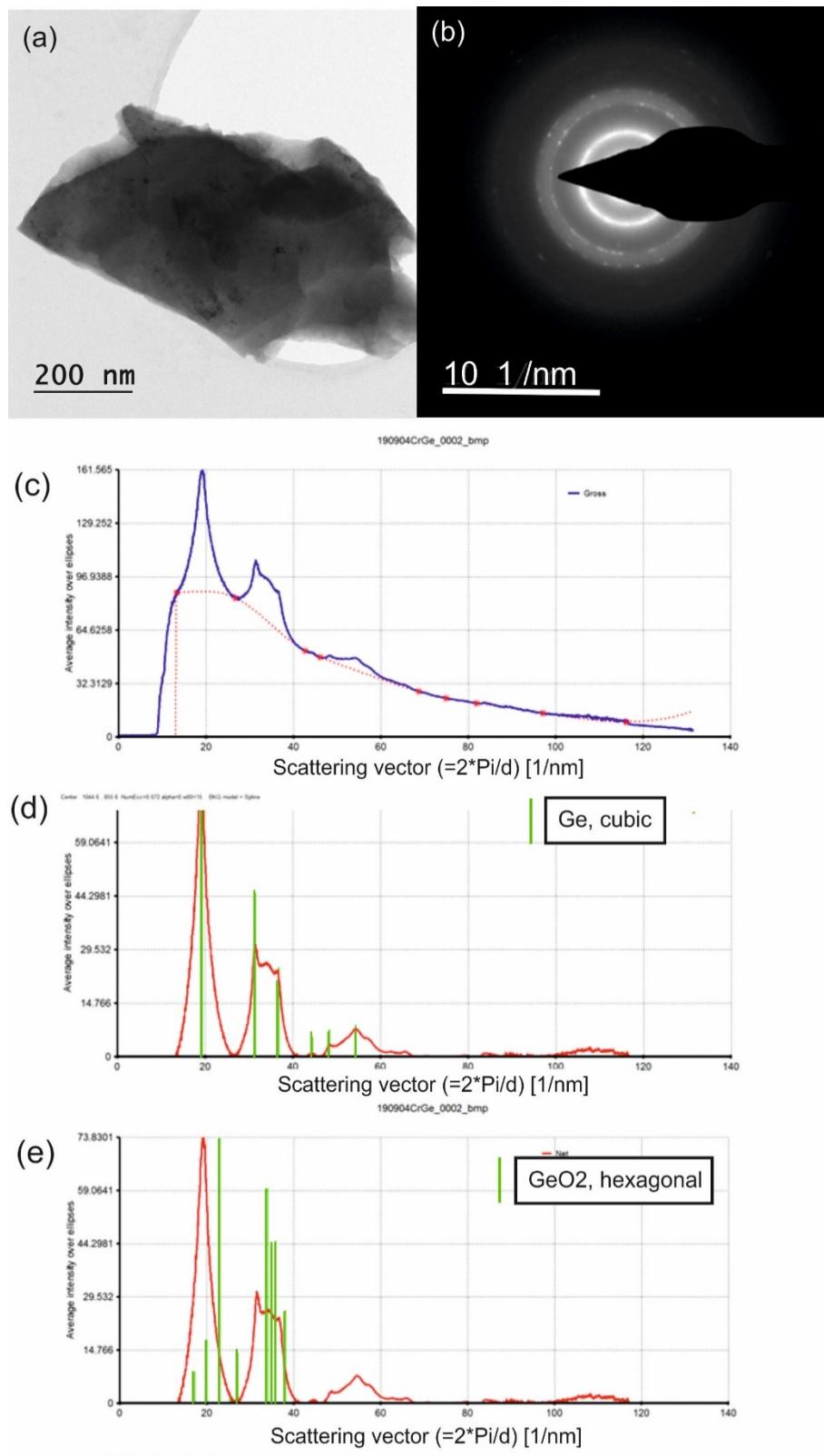


Figure S6: SAED analysis of an irregular object. (a) SEM photo, (b) SAED image, (c) SAED image converted into an intensity diffractogram, before background subtraction, and (d) Ge cubic (PDF 89-3833) and (e) Ge hexagonal (PDF 51-0767) markers in diffractogram after background subtraction. Diffuse rings and distinct points indicate an amorphous phase and the cubic/hexagonal phase, respectively.

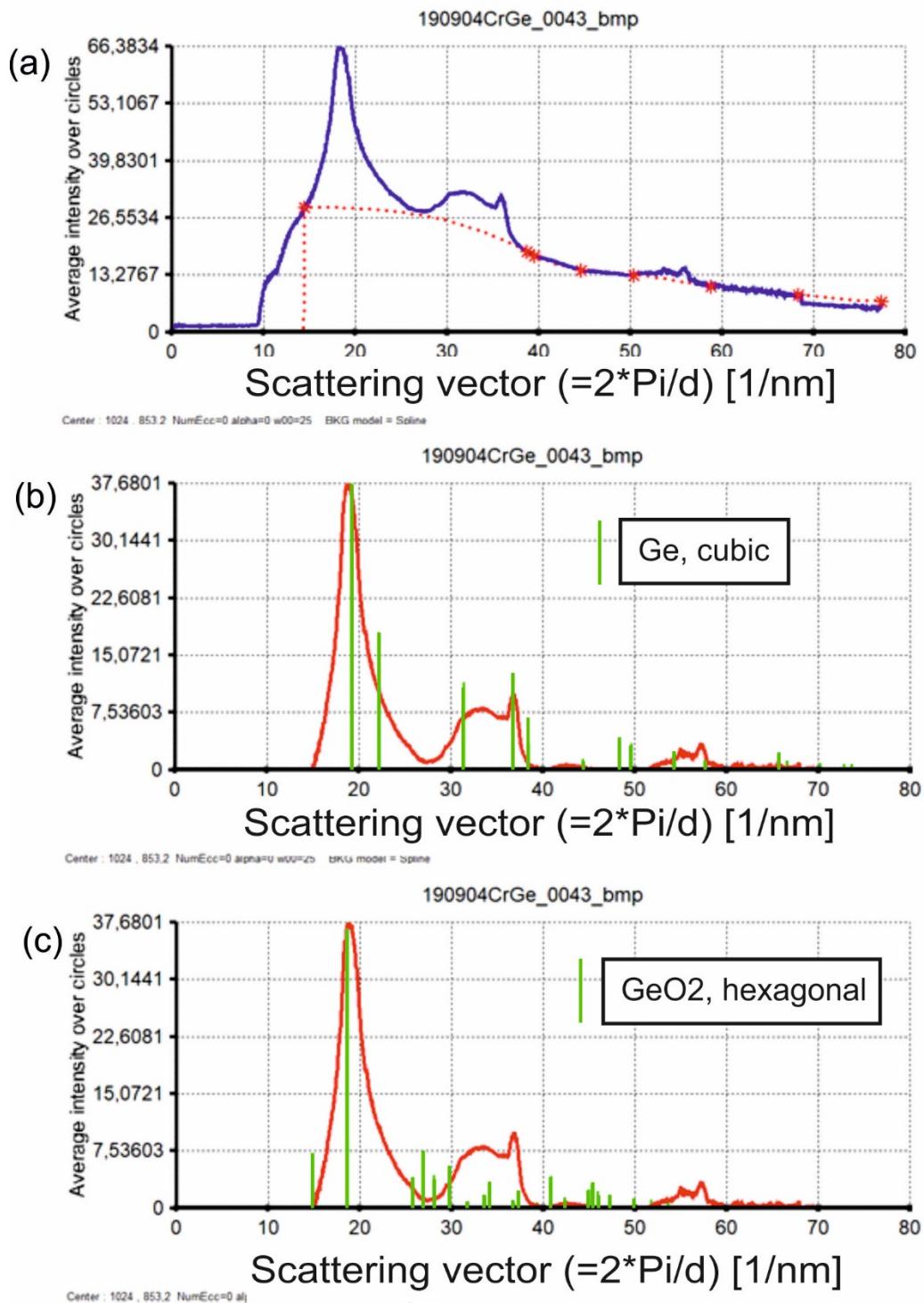


Figure S7: SAED image (Figure 3b) converted into (a) an intensity diffractogram, before background subtraction, (b) Ge cubic (PDF 65-9202) and (c) GeO₂ hexagonal (PDF 83-0544) markers in diffractogram after background subtraction.

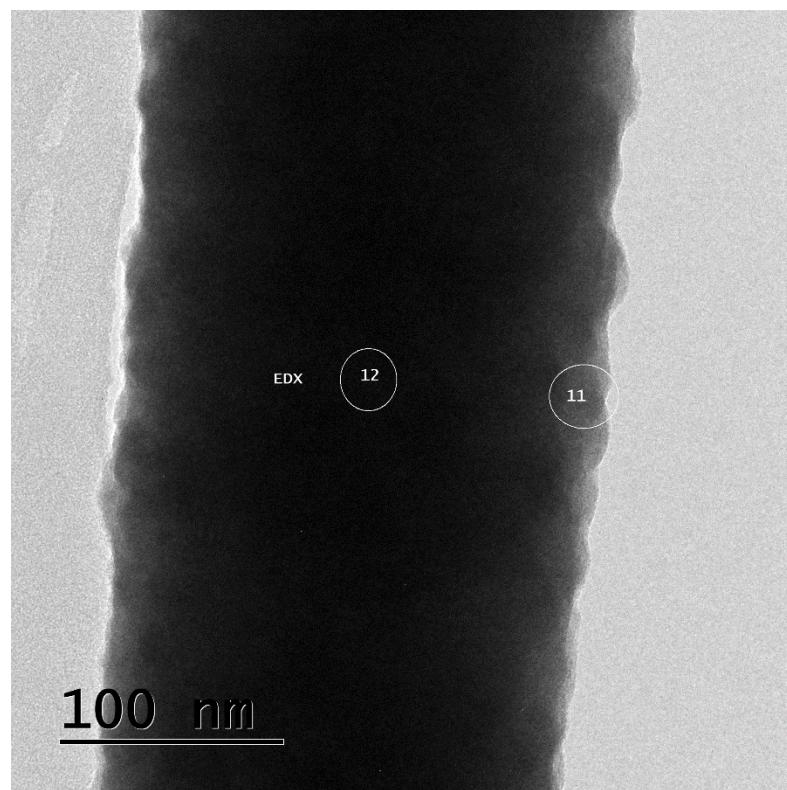
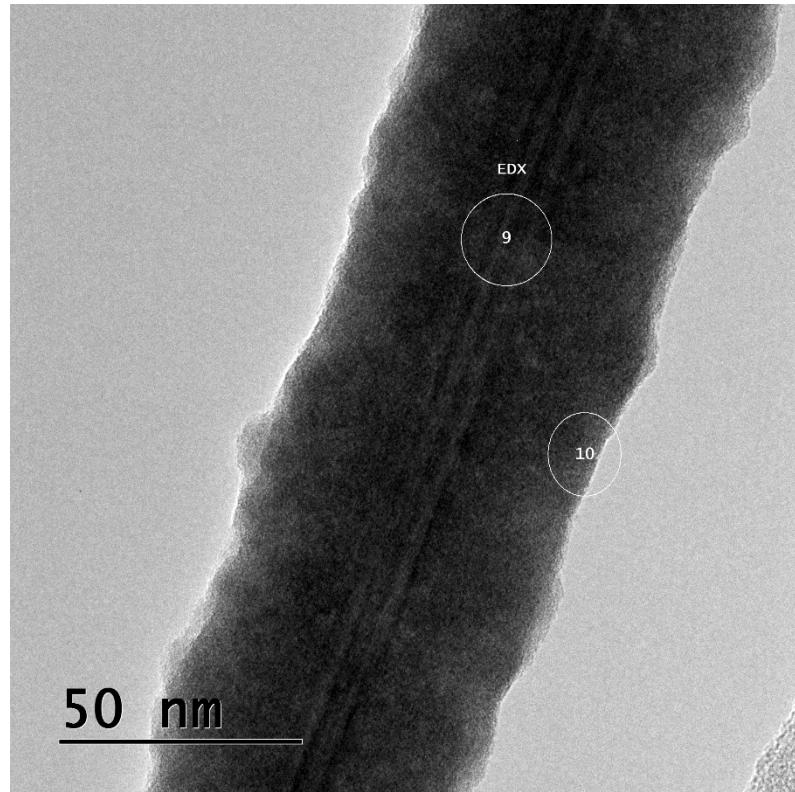


Figure S8: HRTEM images of a nanowire body with indicated EDX spots.

Elemental composition:

$[\text{Cr}]/[\text{Ge}]/[\text{O}] = 1:9.7:3.8$, point 9- middle of NW comprising core+coating

$[\text{Cr}]/[\text{Ge}]/[\text{O}] = 1:6.5:4.0$, point 10 – only NW coating

$[\text{Cr}]/[\text{Ge}]/[\text{O}] = 1:7.0:4.3$, point 11 - only NW coating

$[\text{Cr}]/[\text{Ge}]/[\text{O}] = 1:9.0:4.0$, point 12 - middle of NW comprising core+coating

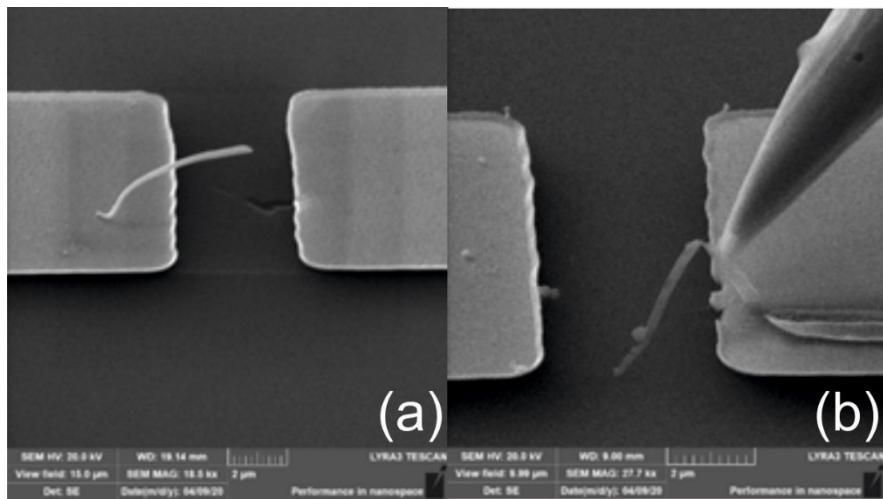


Figure S9: (a, b) unsuccessful attempt to transfer the NW onto lithographic pads.

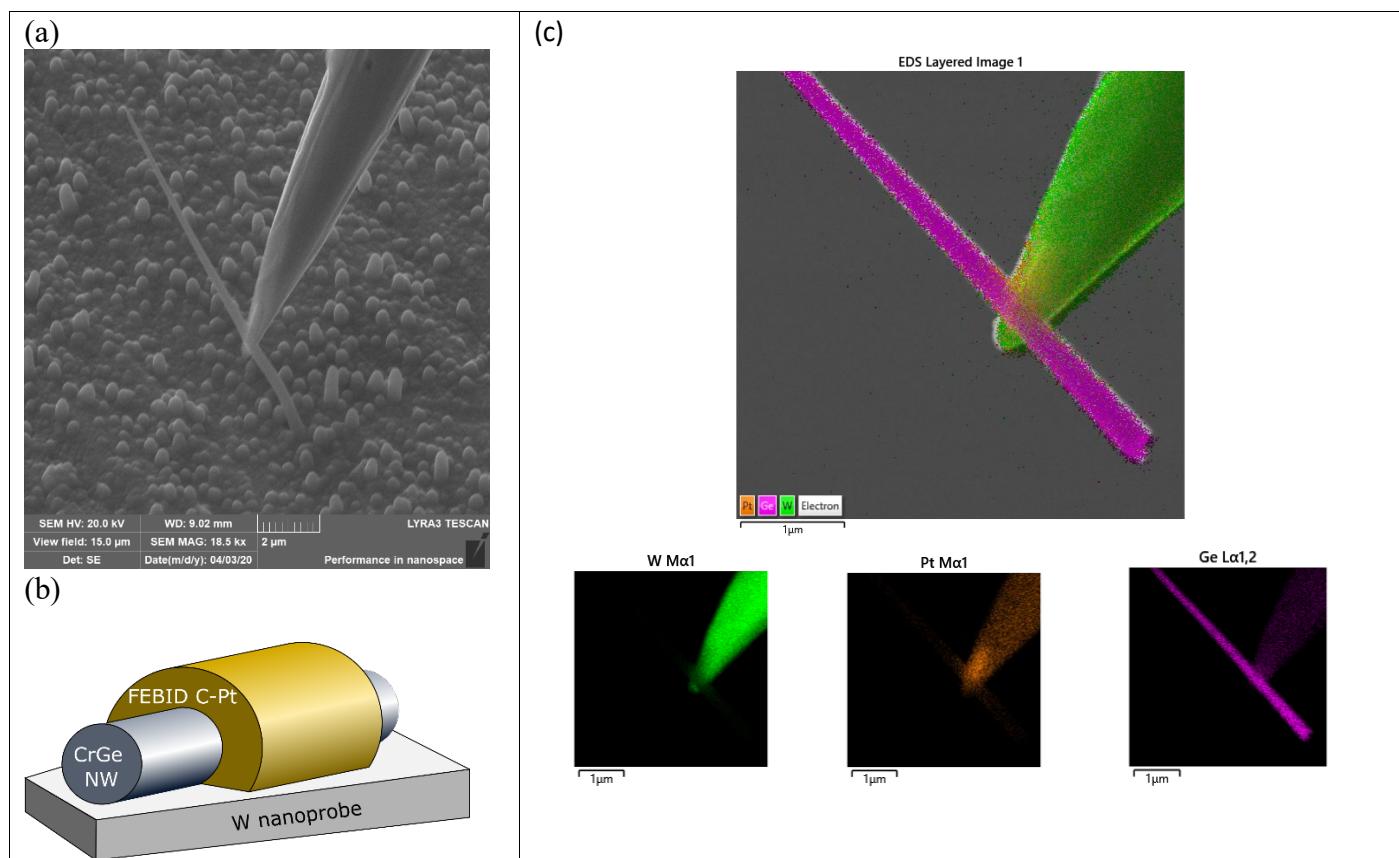


Figure S10: (a) SEM image of the GeCr nanowire that was contacted by the nanomanipulator tip for $I-V$ measurements, (b) the detail of the point contact between the CrGe_x nanowire and the nanomanipulator tip, and (c) elemental mapping of the point contact between the CrGe_x nanowire and tungsten tip.

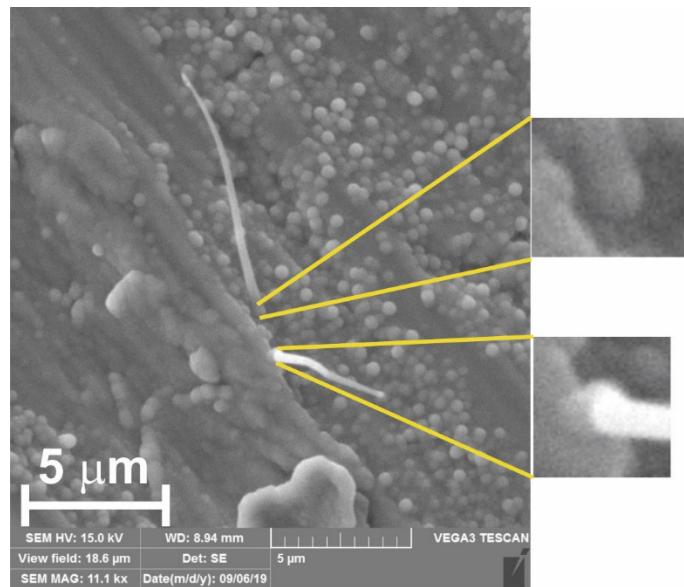


Figure S11: Typical nanowire bottoms corresponding to original nanoballs from which the nanowires started to grow.

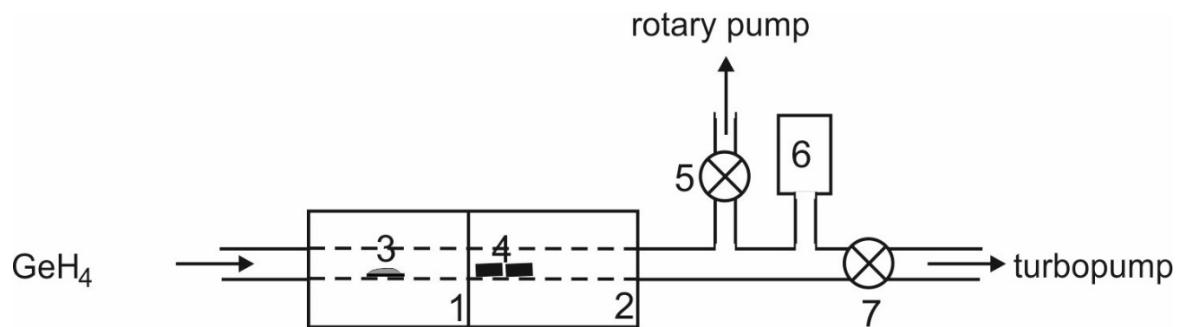


Figure S12: CVD set-up; 1,2 - twin furnace, first (max. 500 °C) and second part (max. 1200 °C), 3 – substrate with Cr(acac)₃, 4 – substrates for deposits, 5 – valve, 6 – pressure gauge, 7 – gate valve.