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Authors	Varo, Simone;Li, Xin;Juska, Gediminas;Ranjbar Jahromi, Iman;Gocalińska, Agnieszka M.;Di Falco, Andrea;Pelucchi, Emanuele
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Supporting information

Planar Semiconductor Membranes with Brightness-enhanced Embedded Quantum Dots via Electron Beam Induced Deposition of 3D Nanostructures: Implications for Solid State Lighting

*Simone Varo[1] *‡, Xin Li[2]‡, Gediminas Juska[1], Iman Ranjbar Jahromi[1], Agnieszka M. Gocalinska[1], Andrea Di Falco[2] and Emanuele Pelucchi[1]*

1 Tyndall National Institute, University College Cork, Dyke Parade, Cork, T12R5CP, Republic of Ireland

2 SUPA, University of St. Andrews, School of Physics & Astronomy, Physical Science Building, North Haugh, St Andrews, KY16 9SS, United Kingdom

* simone.varo@tyndall.ie

List of contents

1. **Images of each of the structures fabricated during the first set of depositions……S2**
   - **1.1 Platinum patterns**
   - **1.2 SiO2 patterns**
2. **Images and data of the second set of depositions……S5**
3. **EDX analysis of SiOx structures……S8**

1. High resolution images of each of the structures fabricated during the first set of depositions

1.1. Platinum patterns

All of these patterns have been fabricated using the precursor $(Me_3)MeCpPt$, and decomposing it with a deposition current of 150 pA, accelerating voltage of 3 kV, dose of 1 C/cm^2, step size of 20 nm, and dwelling time of 50ms, at room temperature

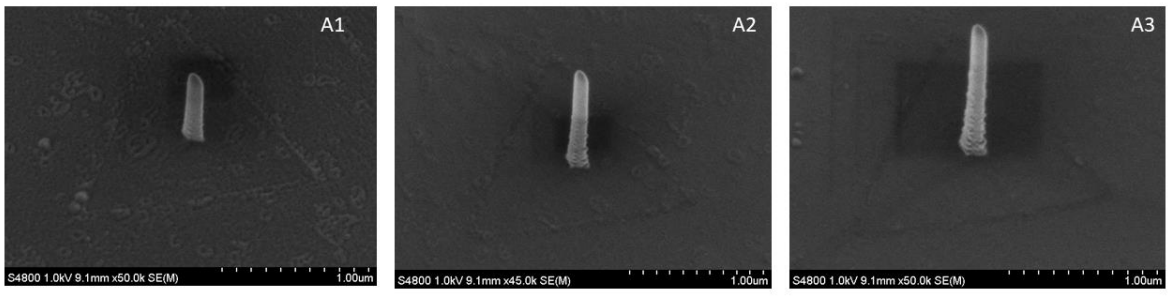


Figure S1: Pt pillars fabricates during the first set of depositions

1.2. SiO2 patterns

All of this structuers have been fabricated by decomposing the precursor Penta Methyl Cyclo Penta Siloxane (PMCPS), with a deposition current of 150 pA, accelerating voltage of 3 kV, dose of 1 C/cm^2, step size of 10 nm, and dwelling time of 0.01ms with variable (100-5000) writing loops at room temperature

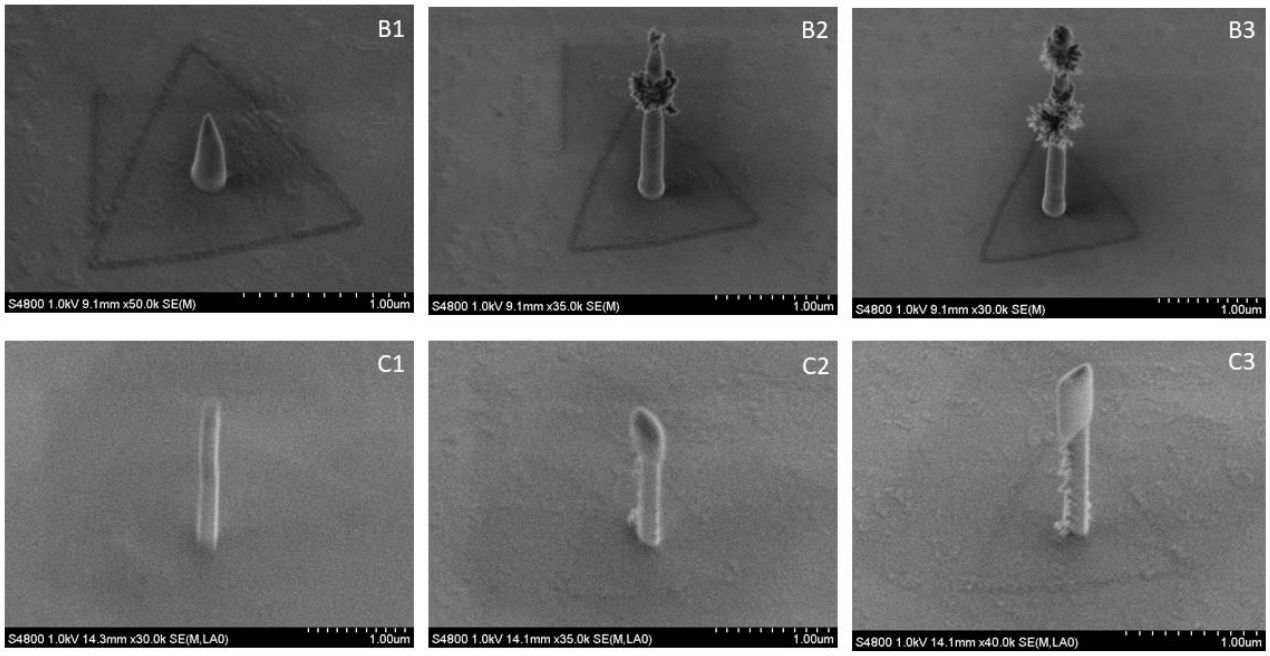


Figure S2 Si-O-C structures fabricated during the first set of depositions from B1 to C3

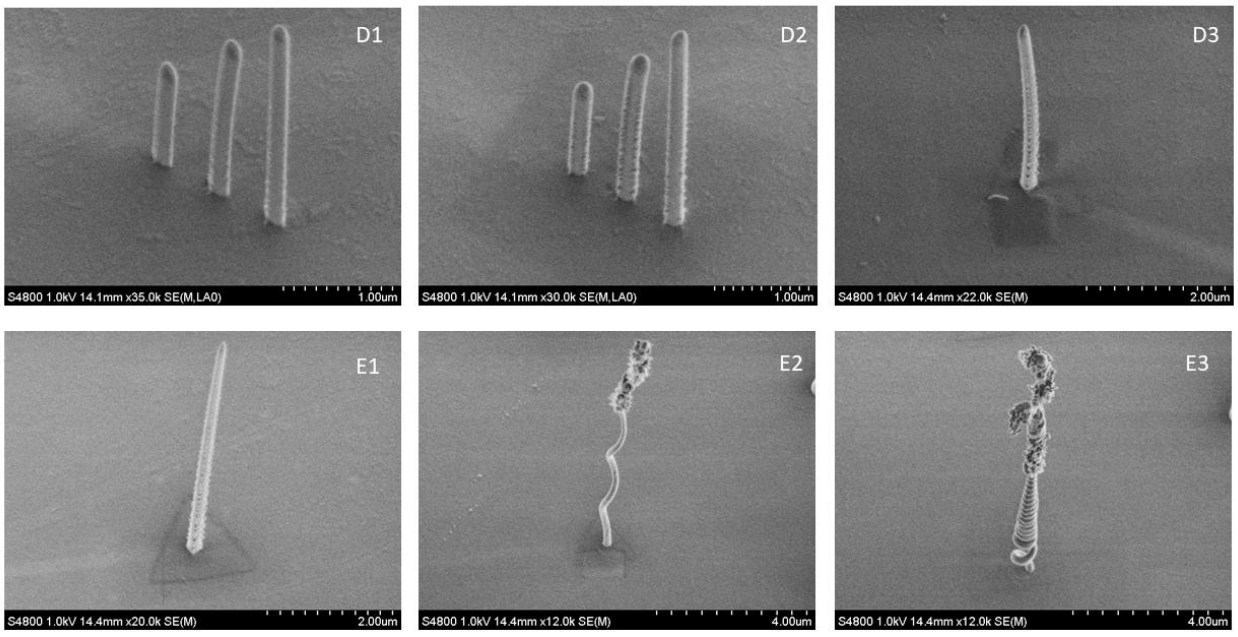


Figure S3 Si-O-C structures fabricated during the first set of depositions, from D1 to E3

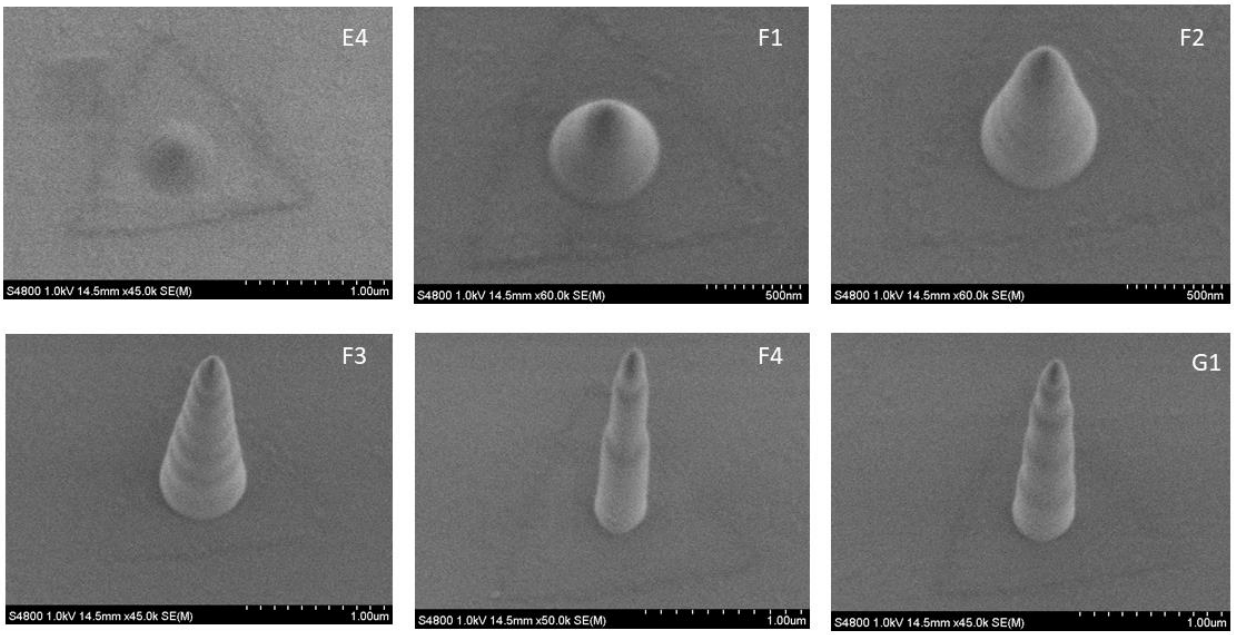


Figure S4 Si-O-C structures fabricated during the first set of depositions, from E4 to G1

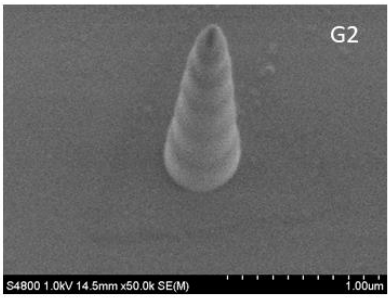


Figure S5 Si-O-C structure fabricated during the first set of depositions, G2

2. **Second set of depositions on previously mapped QDs**
   All of this depositions are of SiO2 pillars, deposited using the same conditions employed for the first series

Table S1 Geometrical parameters of the structures fabricated during the second set of depositions

Sample #	w (nm)	h (nm)
1	576	250
2	609	617
3	613	904
4	620	1200
5	641	1530
6	657	1700
7	647	1650

Sample #6 shows irregular pattern due to the fabrication error. Please check the SEM image.

Sample #	w (nm)	h (nm)
8	496	206
9	536	530
10	566	810
11	569	1070
12	576	1310
13	588	1450
14	391	177
15	432	367
16	481	571
17	464	793
18	465	1020
19	476	1070

Sample #	w (nm)	h (nm)
20	285	140
21	341	283
22	357	391
23	361	511
24	373	673
25	376	749
26	199	119
27	225	146
28	261	202
29	257	276
30	270	338

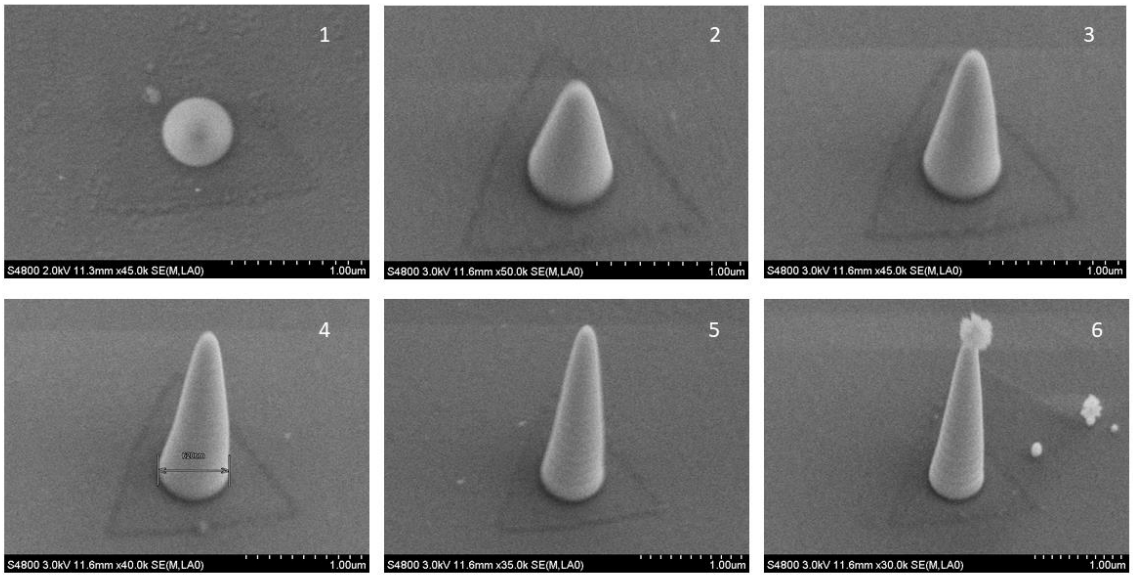


Figure S6 Si-O-C structures fabricated during the second set of depositions, 1 to 6

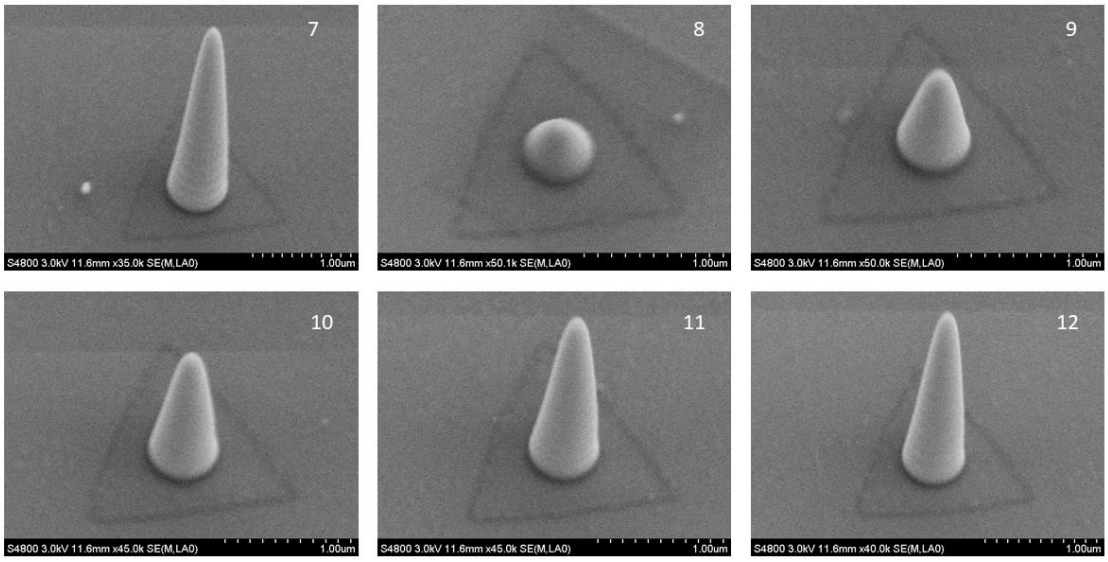


Figure S7 Si-O-C structures fabricated during the second set of depositions, from 7 to 12

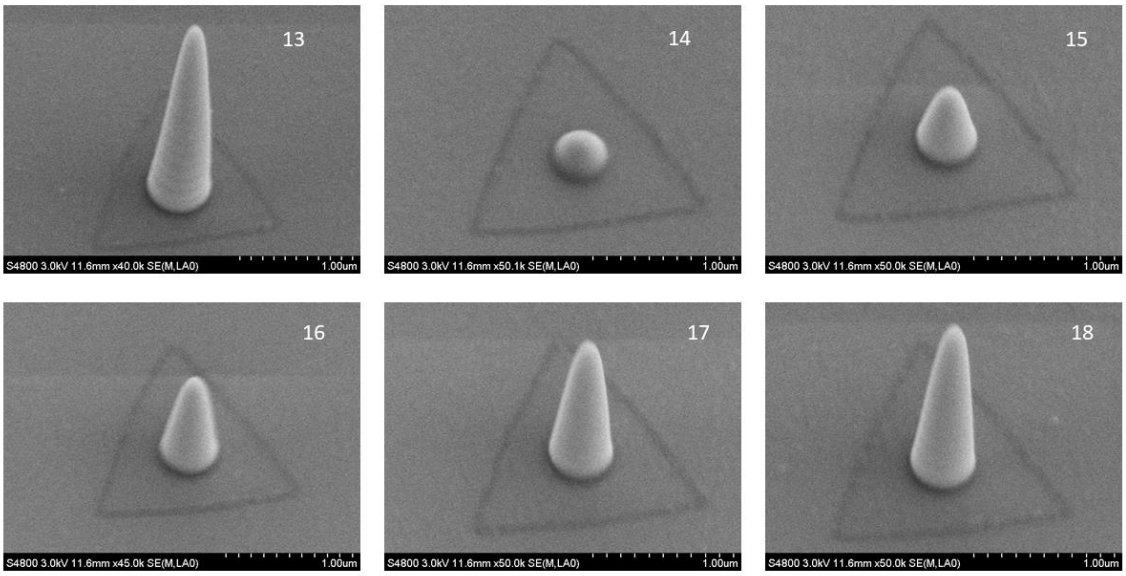


Figure S8 Si-O-C structures fabricated during the second set of depositions, from 13 to 18

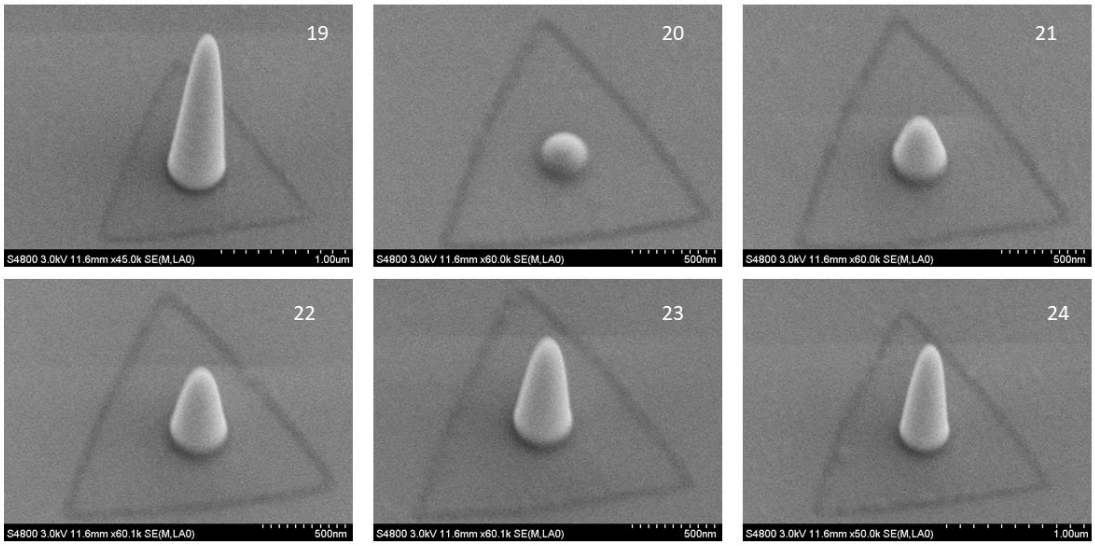


Figure S9 Si-O-C structures fabricated during the second set of depositions, from 19 to 24

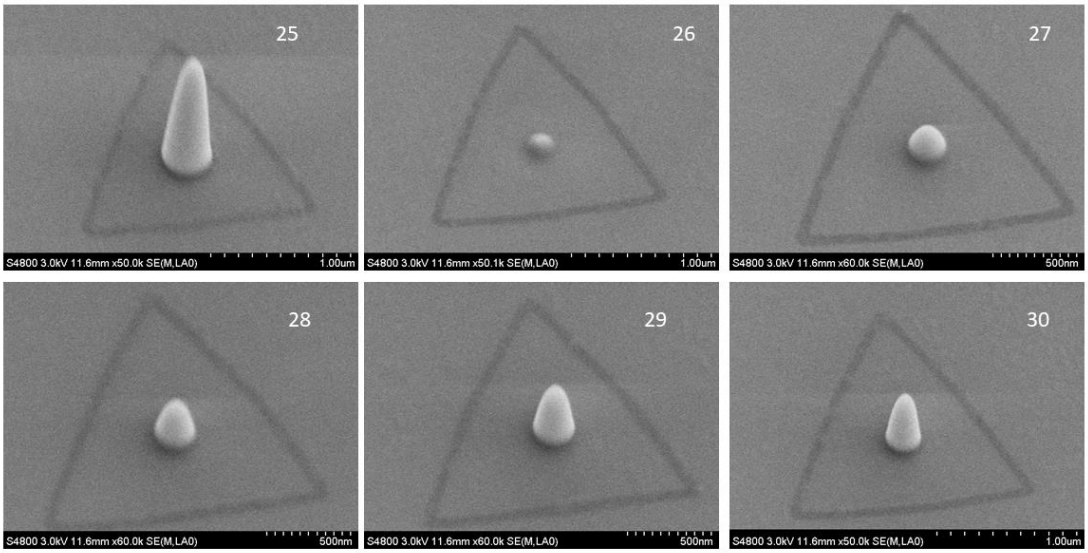


Figure S10 Si-O-C structures fabricated during the second set of depositions, from 25 to 30

3. EDX analysis of SiOx structures

EDX analysis was performed on SiOx nanostructures using a Quanta 650 SEM. A typical spectrum and elemental analysis are included.

Table S2 Results of the EDX analysis. Atomic percentages rounded to the nearest integer

Element	Weight%	Atomic%
O K	19.85	47
Si K	12.45	17
Ga K	31.41	17
As L	36.29	18
Totals	100.00	

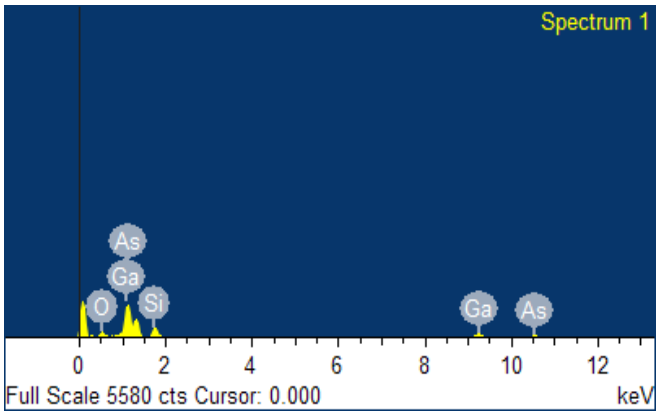


Figure S11 EDS spectrum of the analyzed structure

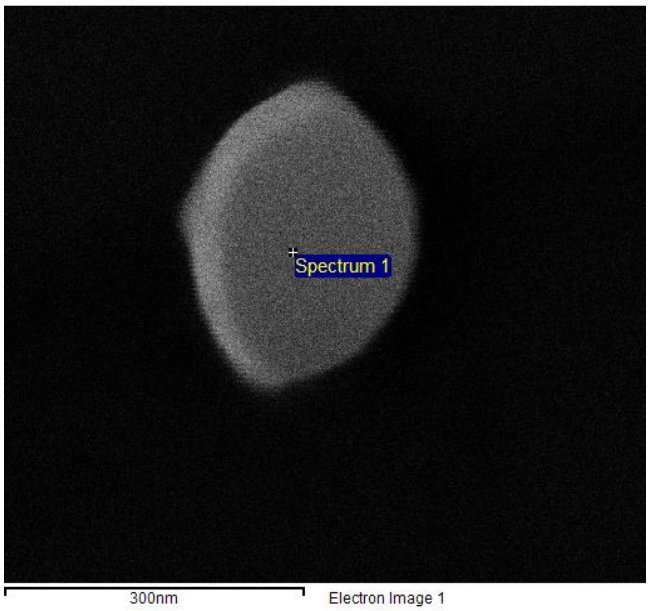


Figure S12 SEM image of the structure analyzed, with the specific point the analysis was performed onto marked out