Supplementary information

Silicon Nanoparticles: Characterization and Toxicity Studies

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Characterization of silicon nanoparticles

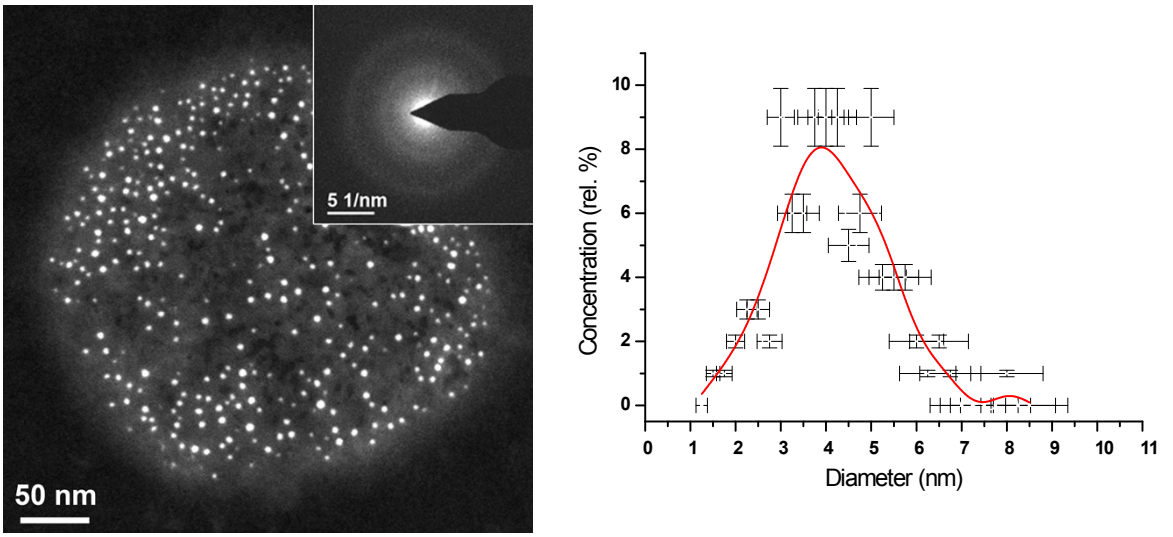


Figure S1. TEM data and particle size distribution for Sample 1

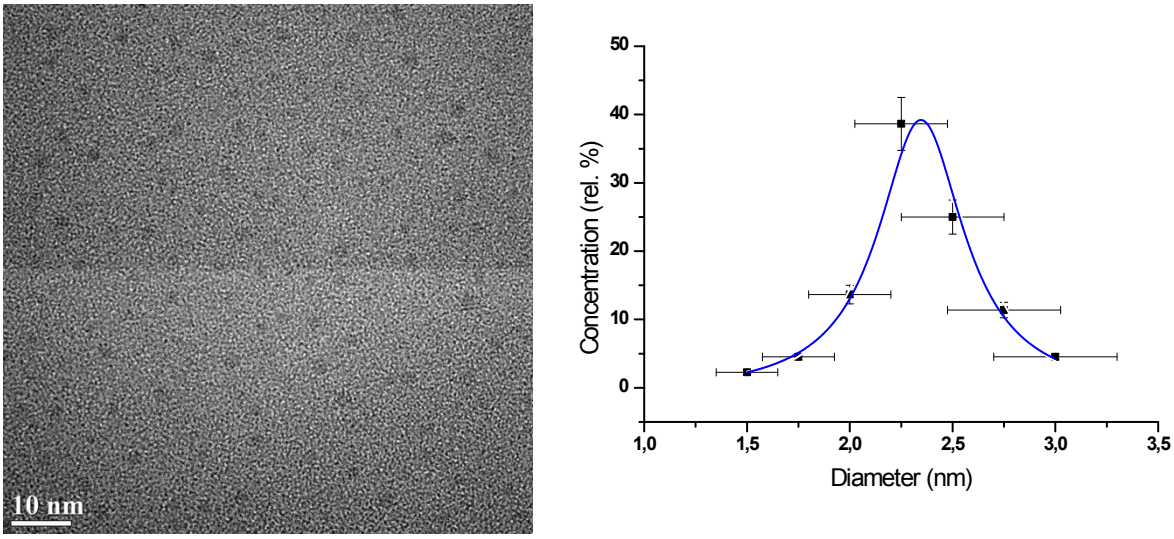


Figure S2. TEM data and particle size distribution for Sample 2.

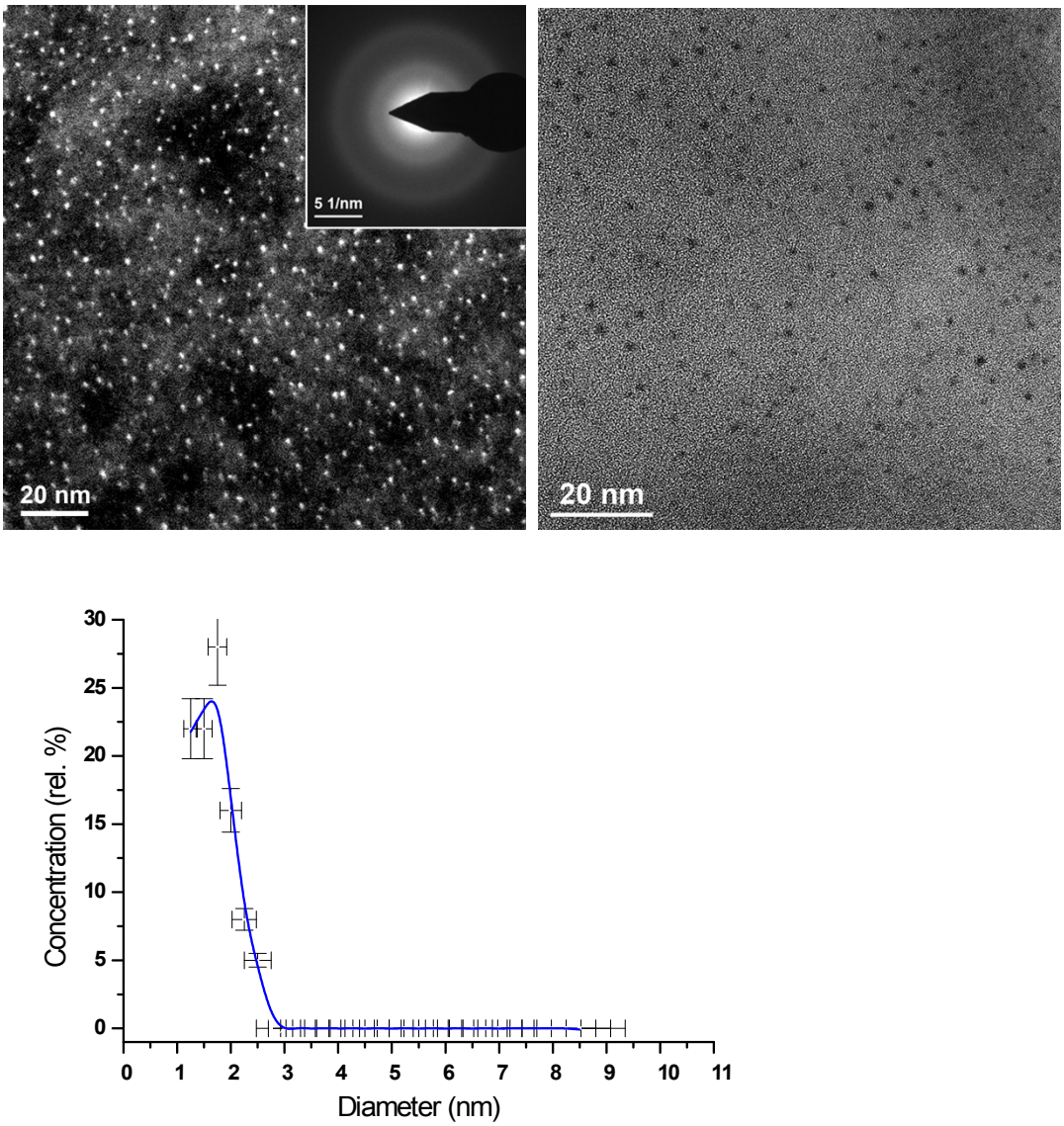


Figure S3. TEM data and particle size distribution for Sample 3.

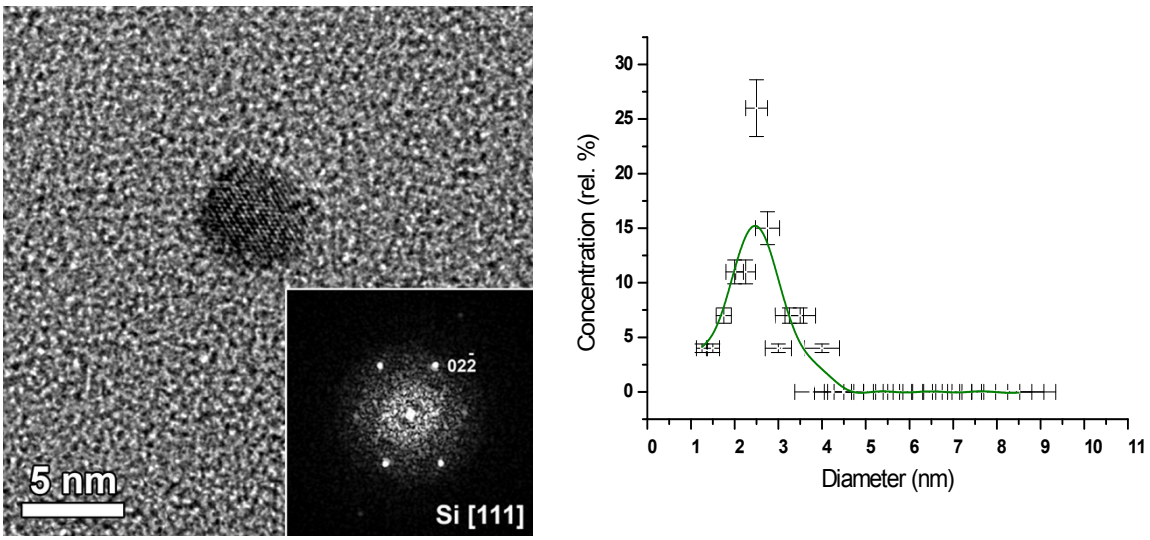


Figure S4. TEM data and particle size distribution for Sample 4.

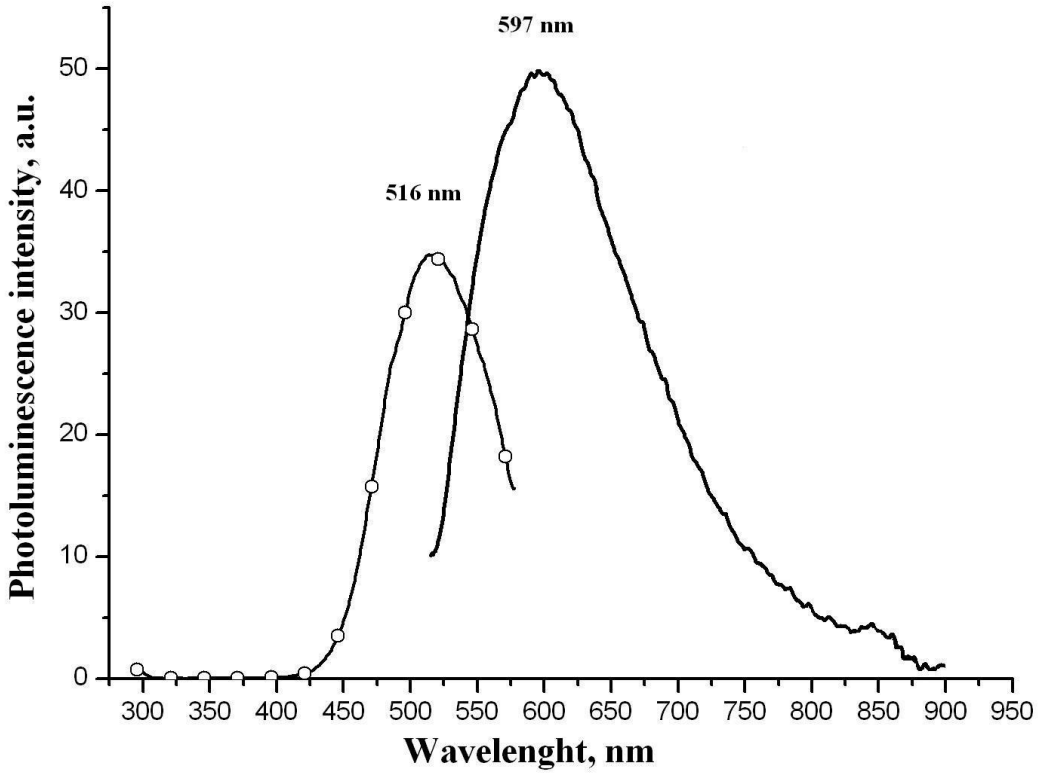


Figure S5. Photoluminescence for Sample 1. Spectrum of excitation (–o–), λ_f = 592 nm; spectrum of photoluminescence (–), λ_{ex} = 510 nm.

a.

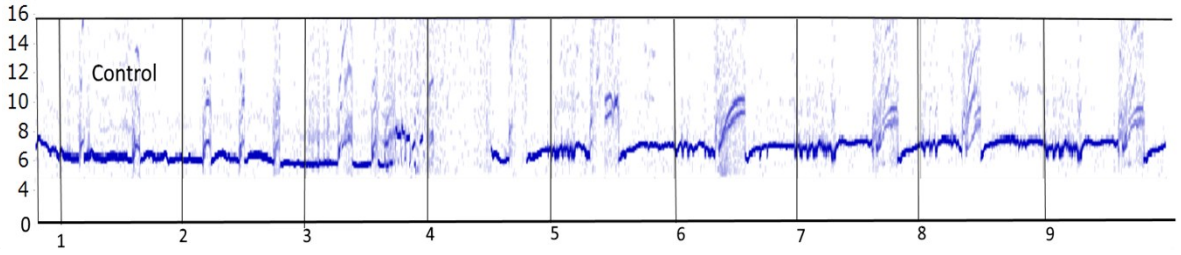


Figure S6a. Heartbeat rates in the control group. The X – axis represents the duration (days) of the experiment, the Y – axis depicts the time between heart beats (range 0-16 seconds), the intensity of the color is proportional to the time intervals between beats. The first arrow indicates the start of the experiment, the second arrow indicates the moment of death (whenever applicable).

b.

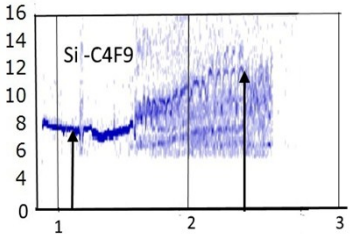


Figure S6b. Toxic effect of sample 1 on the heartbeat of mussels *Anodonta anatina*.

c.

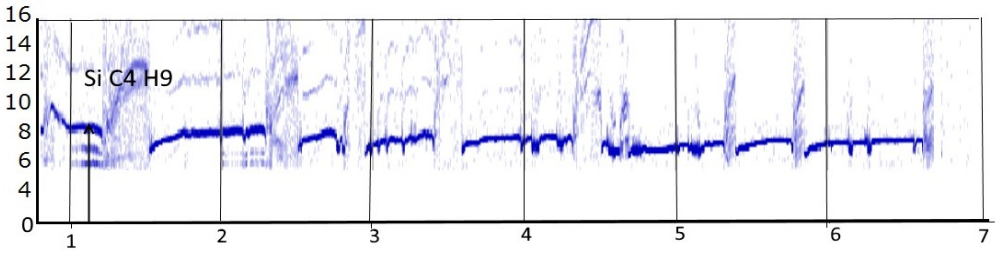


Figure S6c. Toxic effect of sample 2 on the heartbeat of mussels *Anodonta anatina*.

d.

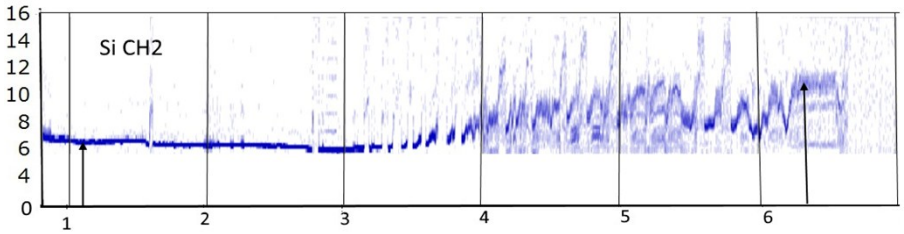


Figure S6d. Toxic effect of sample 3 on the heartbeat of mussels *Anodonta anatina*.

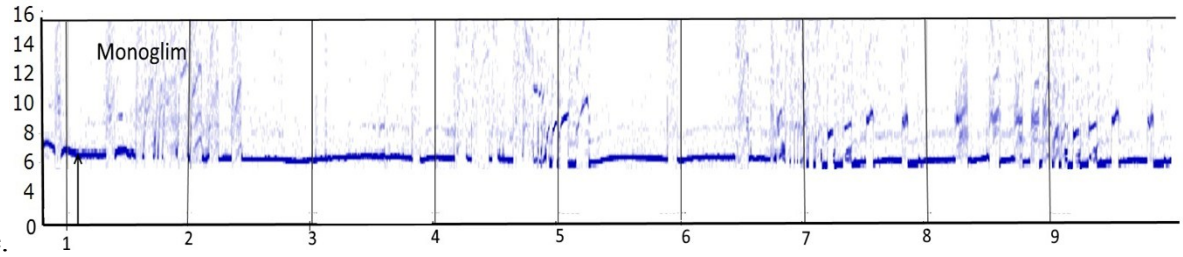
e. 

Figure S6e. Toxic effect of the solvent (monoglym) on the heartbeat of mussels *Anodonta anatina*.

Table S1. Description of mollusks for nanotoxicity tests

Animal no.	Length, mm	Total mass, g	Shell mass, g	Animal no.	Length, mm	Total mass, g	Shell mass, g
1	82	56	32	1	80	62	34
2	86	61	35	2	83	68	40
3	80	63	35	3	81	64	37
4	89	66	36	4	86	64	35
5	81	62	38	5	84	59	32
6	83	64	38	6	82	58	30
7	84	59	36	7	83	60	31
8	87	62	38	8	81	59	32
9	84	60	34	9	88	67	39
10	88	68	38	10	85	64	32

Table S2. Chemical analysis data (EDAX) for the samples of nanosilicon

Sample	C	O	Si	Cl	Br	F	Hg
1	95.8	2	0.4	1.4	0.2	0.2	-
2 (field 1)	76.6	7.9	2.2	9.4	3.9	-	-
2 (field 2)	79.2	11.9	4.3	2.7	1.9	-	-
3	93	4.3	2.7	-	-	-	-
4	93.2	5	1.8	-	-	-	-

Table S3. Si content in the gills of *Anodonta anatina*, mg/kg of dry weight.

No.	Control	Sample 1	Sample 2	Sample 3	Sample 4
1	31.2	110	32	106	32
2	37.9	190	34.2	135	34
3	36.5	116	38.2	145	62.2
4	56.4	73	53.7	55.7	49.4
5	47.3	60	129	59	48.3
6	60	84	44.1	63	51.1
7	65.1	140	56.4	74.5	34.1
8	35.6	62	58.4	71	39
9	32.1	57	51.6	62.5	39.1
10	40.4	121	42	51.4	37
Group's mean	44.25	101.3	53.96	82.31	42.62
Error of the mean	10.36	34.1	16.38	27.81	8.14

Table S4. Si content in the liver of *Anodonta anatina*, mg/kg of dry weight.

No.	Control	Sample 1	Sample 2	Sample 3	Sample 4
1	79.5	66.3	55.5	616	50.9
2	93.8	238	63.6	122	84.7
3	70.6	240	37.4	100	68.5
4	87.4	285	90.4	115	76.5
5	61.9	182	56.2	178	76.2
6	77.5	222	74.8	110	78
7	63.6	152	154	187	72
8	89.3	212	53.2	133.5	60.5
9	126	112	65.8	211	139.5
10	125	139	72.5	114	67
Group's mean	87.46	184.83	72.34	188.65	77.38
Error of the mean	16.85	54.57	20.46	89.94	14.01