Separation and preparation of nanoparticles of urban dust for biological studies

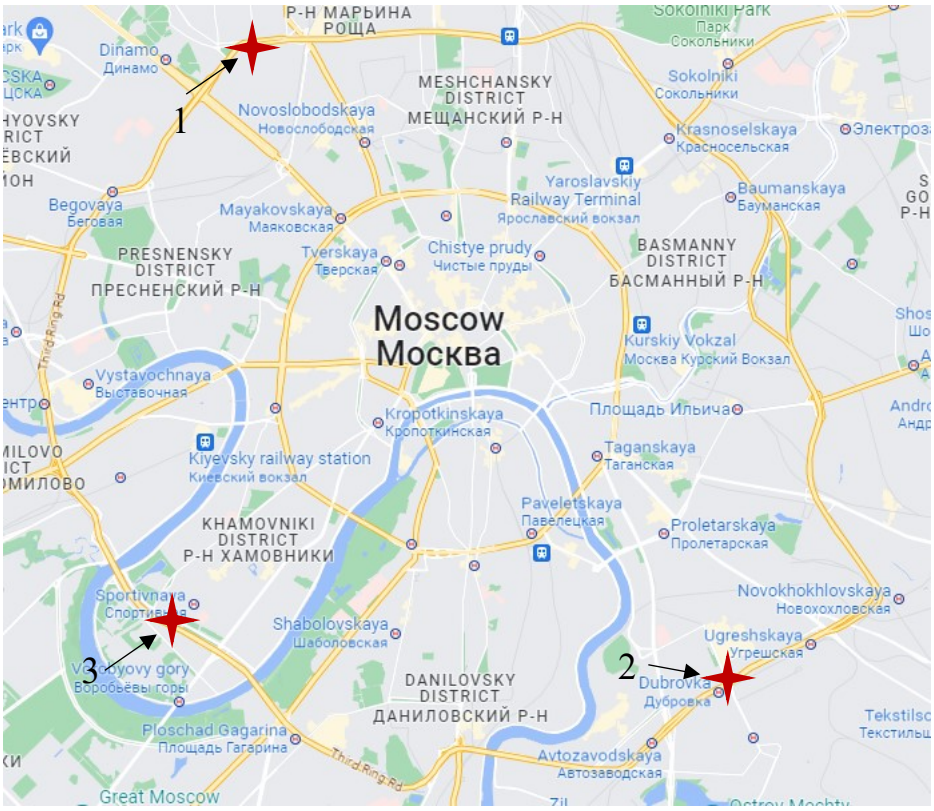


Fig. S1. Sampling sites (marked by red) of urban dust in Moscow central district.

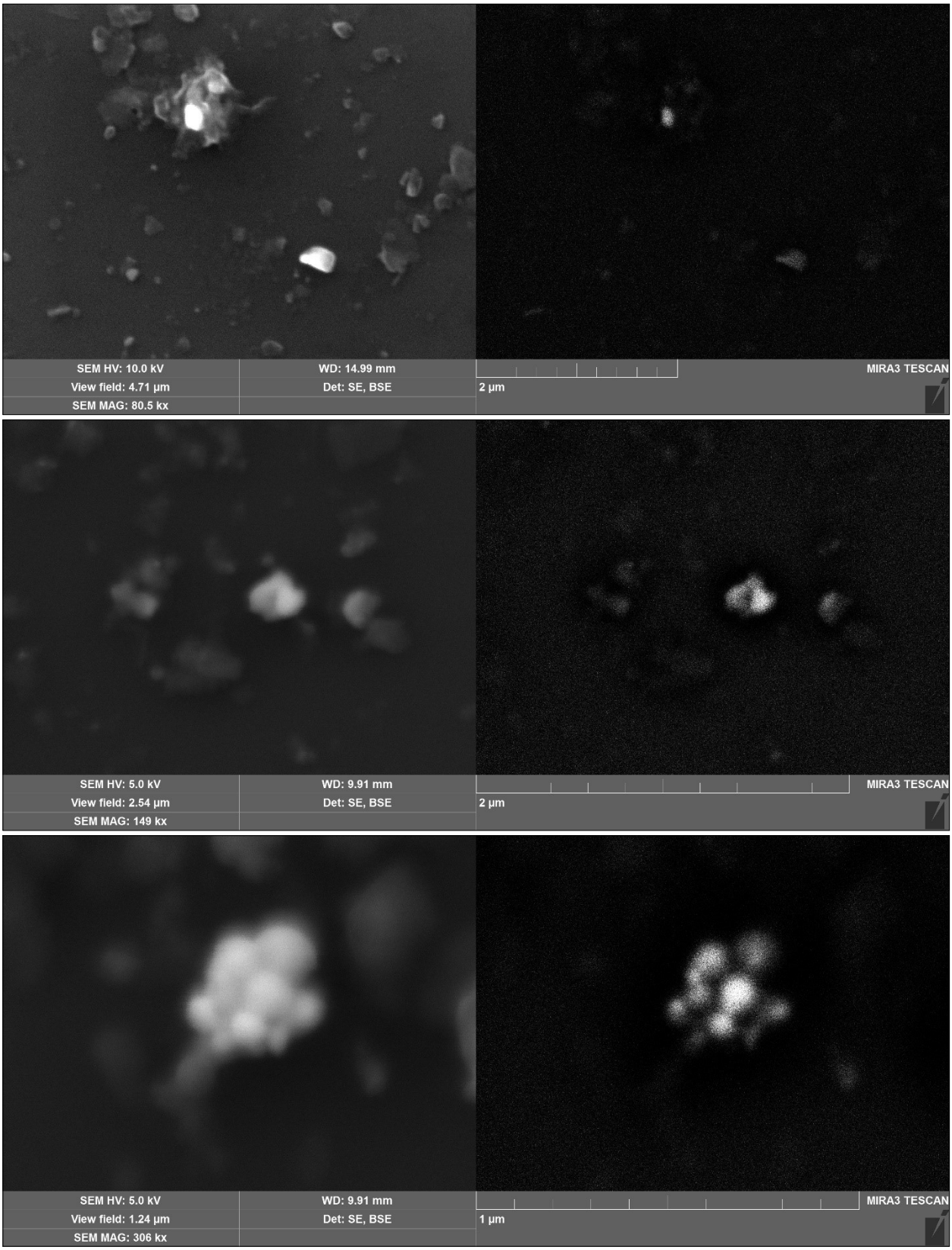


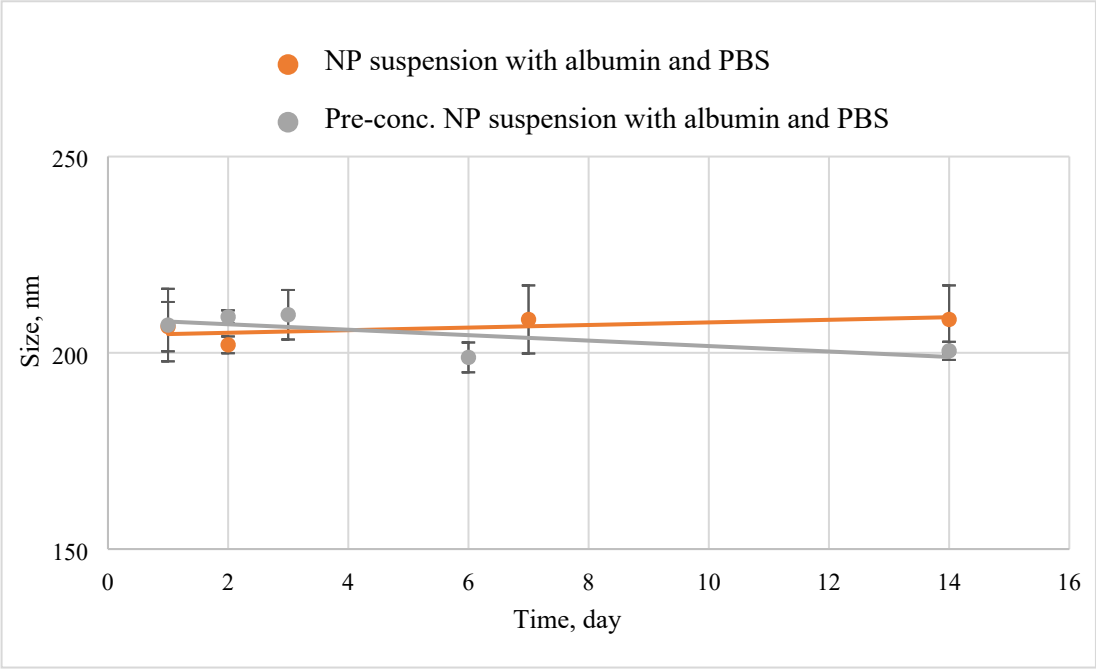
Fig. S2. Micrographs of NPs as obtained by scanning electron microscopy. The left micrographs were obtained by the secondary electrons mode, the right ones by the backscattered electrons mode

Table S1. Content of elements in three collected bulk samples and three corresponding recovered nanoparticle fractions as determined by ICP-MS and ICP-AES and in upper continental crust.

Element	Concentration, µg kg^{-1}							
	LOD	Bulk sample			Nanoparticles			UCC*
		1	2	3	1	2	3	
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Li	0.07	11.7	10.7	11.7	14	103	21	24
Be	0.07	1.1	0.9	1.1	< LOD	< LOD	1.4	2,1
B	8	-	-	-	114	< LOD	161	17
Na	34	$11.6 \cdot 10^3$	$11.7 \cdot 10^3$	$15.0 \cdot 10^3$	$23 \cdot 10^3$	$30 \cdot 10^3$	$10 \cdot 10^3$	$24 \cdot 10^3$
Mg	18	$16.1 \cdot 10^3$	$17.7 \cdot 10^3$	$23.3 \cdot 10^3$	$5.5 \cdot 10^3$	$41 \cdot 10^3$	$11 \cdot 10^3$	$15 \cdot 10^3$
Al	47	$44.5 \cdot 10^3$	$47.8 \cdot 10^3$	$55.9 \cdot 10^3$	$8.5 \cdot 10^3$	$121 \cdot 10^3$	$25 \cdot 10^3$	$81 \cdot 10^3$
P	150	$1.2 \cdot 10^3$	$0.8 \cdot 10^3$	$1.5 \cdot 10^3$	$4.6 \cdot 10^3$	$15 \cdot 10^3$	$17 \cdot 10^3$	$0.7 \cdot 10^3$
S	83	$1.8 \cdot 10^3$	$1.2 \cdot 10^3$	$2.5 \cdot 10^3$	$10 \cdot 10^3$	$32 \cdot 10^3$	$28 \cdot 10^3$	$0.6 \cdot 10^3$
K	45	$11.6 \cdot 10^3$	$11.7 \cdot 10^3$	$10.3 \cdot 10^3$	$5.5 \cdot 10^3$	$31 \cdot 10^3$	$24 \cdot 10^3$	$23 \cdot 10^3$
Ca	65	$98.4 \cdot 10^3$	$86.8 \cdot 10^3$	$93.4 \cdot 10^3$	$31 \cdot 10^3$	$78 \cdot 10^3$	$67 \cdot 10^3$	$26 \cdot 10^3$
Sc	2	13.4	13.7	22.8	< LOD	< LOD	< LOD	14
Ti	8	$4.9 \cdot 10^3$	$4.8 \cdot 10^3$	$11.4 \cdot 10^3$	$0.2 \cdot 10^3$	$1.6 \cdot 10^3$	$0.7 \cdot 10^3$	$3.8 \cdot 10^3$
V	5	134	117	278	95	< LOD	70	97
Cr	6	105	109	102	24	370	140	92
Mn	2	$0.8 \cdot 10^3$	$1.0 \cdot 10^3$	$1.2 \cdot 10^3$	$0.2 \cdot 10^3$	$2.2 \cdot 10^3$	$0.6 \cdot 10^3$	$0.8 \cdot 10^3$
Fe	37	$50.5 \cdot 10^3$	$77.3 \cdot 10^3$	$92.3 \cdot 10^3$	$10 \cdot 10^3$	$176 \cdot 10^3$	$33 \cdot 10^3$	$35 \cdot 10^3$
Co	1	21.4	18.9	34.3	< LOD	117	21	17,3
Ni	4	62	50	55	< LOD	< LOD	54	47
Cu	3	111	82	305	$0.2 \cdot 10^3$	$2 \cdot 10^3$	$1 \cdot 10^3$	28
Zn	6	$0.5 \cdot 10^3$	$2.2 \cdot 10^3$	$0.6 \cdot 10^3$	$0.8 \cdot 10^3$	$37 \cdot 10^3$	$2 \cdot 10^3$	67
Ga	1	10.5	9.8	14.0	< LOD	< LOD	9	17,5
As	1	6.5	6.2	4.8	< LOD	< LOD	< LOD	4,8
Se	4	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	-
Rb	0.1	48	44	40	22	187	67	84
Sr	0.3	276	263	294	109	430	228	320
Y	0.01	21	17	29	3.8	38.9	11.9	21
Zr	0.9	148	120	210	14.5	75.0	38.6	193
Nb	0.1	8.9	7.9	14.5	25.8	6.9	1.4	12
Mo	0.5	4.1	4.5	5.3	9.9	< LOD	3.7	1,1
Rh	0.05	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	-
Pd	0.2	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	0,00052
Ag	0.03	0.14	0.11	0.33	2.38	14	5.9	0,053
Cd	0.07	0.33	0.19	0.23	< LOD	< LOD	2.1	0,09
Sn	0.4	5.8	6.3	6.8	60	< LOD	7.6	2,1
Sb	0.04	5.9	4.7	5.4	5.7	51	20	0,4
Te	0.1	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	-
Cs	0.01	1.0	0.9	0.9	0.9	12	2.5	4,9
Ba	0.9	450	390	461	115	700	360	628
La	0.01	26	21	31	4.9	67	31	31
Ce	0.03	57	45	68	12	145	35	63

1	2	3	4	5	6	7	8	9
Pr	0.01	5.8	4.7	7.5	1.1	14	3.8	7,1
Nd	0.01	24	20	32	5.3	57	15	27
Sm	0.01	4.7	4.0	6.3	0.9	11	2.8	4,7
Eu	0.005	1.0	0.8	1.4	0.05	1.3	0.5	1
Gd	0.005	4.1	3.5	5.8	0.07	6.1	2.0	4
Tb	0.006	0.6	0.5	0.9	0.1	1.5	0.5	0,7
Dy	0.006	3.2	2.8	4.6	0.9	7.9	2.5	3,9
Ho	0.006	0.7	0.6	1.0	0.1	1.6	0.5	0,83
Er	0.005	1.9	1.7	2.8	0.4	4.4	1.2	2,3
Tm	0.006	0.3	0.2	0.4	< LOD	0.7	0.2	0,3
Yb	0.006	1.8	1.6	2.7	0.4	3.4	1.0	1,96
Lu	0.005	0.3	0.22	0.4	0.07	0.6	0.2	0,31
Hf	0.04	4.1	3.3	5.9	0.4	22	1.7	5,3
Ta	0.06	0.6	0.6	0.9	< LOD	< LOD	< LOD	0,9
W	0.03	8.8	8.7	8.4	5.8	34	11	1,9
Re	0.01	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	0,0005
Ir	0.01	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	0,0015
Pt	0.02	< LOD	< LOD	< LOD	< LOD	< LOD	< LOD	0,05
Au	0.07	< LOD	0.04	< LOD	< LOD	< LOD	< LOD	0,9
Hg	0.1	0.03	0.02	0.03	2.2	< LOD	11	17
Tl	0.01	0.2	0.2	0.2	0.3	< LOD	0.5	0,16
Pb	0.2	41	41	51	79	3000	330	10,5
Bi	0.01	0.5	0.5	1.1	0.7	7.6	3.1	2,7
Th	0.03	5.9	5.4	5.5	2.3	7.5	5.2	7,1
U	0.01	1.8	1.3	2.0	0.7	12.8	3.3	27

– Upper continental crust (R. L. Rudnick and S. Gao, *TrGeo*, 2003, **3**, 659)



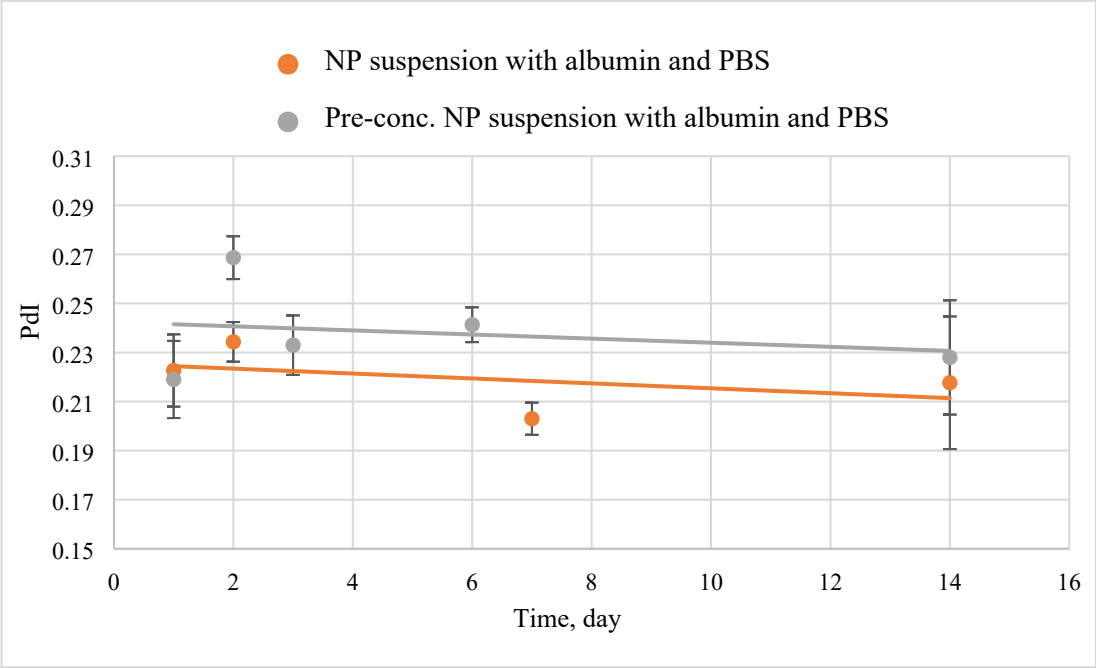


Fig. S3. Z_{av} and PdI of NPs suspension with albumin and PBS (orange line) and pre-concentrated NPs suspension with albumin and PBS (grey line) as measured by DLS. Error bars represent SD from three independent measurements.