Supporting Information

Table S 1 Details of the microparticles used in the experiments including their sizes, initial PNC (undiluted), final PNC (diluted in 2% HNO_3) and mean reference diameter according to the Lab261 protocol.

Microparticles	**Initial PNC [particles/mL]**	**Final PNC [particles/mL]**	**Reference Diameter [µm]**
		Aliquot 1, Aliquot 2, Aliquot 3	
PS 3 µm	$6.7*10^8$	$6.5*10^4$, $6.6*10^4$, $7.6*10^4$	3.10 ± 0.01
PS 4 µm	$2.8*10^8$	$2.9*10^4$, $2.9*10^4$, $2.8*10^4$	4.20 ± 0.17
PS 6 µm	$8.4*10^7$	$9.4*10^4$, $8.3*10^4$, $8.0*10^4$	6.05 ± 0.10
PS 8 µm	$3.6*10^7$	$3.4*10^4$, $3.5*10^4$, $1.8*10^4$	8.12 ± 0.12
PS 10 µm	$1.8*10^7$	$3.6*10^4$, $1.9*10^4$, $1.8*10^4$	9.98 ± 0.10
PS 20 µm	$2.3*10^6$	$0.9*10^4$, $4.6*10^4$, $4.5*10^4$	23.33 ± 1.09
PMMA 5 µm	$1.5*10^8$	$1.4*10^5$, $1.4*10^5$, $1.4*10^5$	5.20 ± 0.14
PMMA 6 µm	$8.4*10^7$	$8.8*10^4$, $8.5*10^4$, $8.1*10^4$	6.20 ± 0.19
PMMA 8 µm	$3.6*10^7$	$3.6*10^4$, $3.6*10^4$, $3.6*10^4$	7.52 ± 0.12
PMMA 10 µm	$1.8*10^7$	$4.6*10^4$, $1.9*10^4$, $1.8*10^4$	10.22 ± 0.30
PMMA 20 µm	$2.3*10^6$	$0.9*10^4$, $2.3*10^4$, $4.7*10^4$	20.03 ± 0.81
PVC 4 µm	$2.2*10^8$	$2.1*10^4$, $2.2*10^4$, $2.2*10^4$	3.69 ± 0.18
PVC 6 µm	$6.4*10^7$	$3.1*10^4$, $3.1*10^4$, $3.2*10^4$	5.59 ± 0.51
PVC 20 µm	$1.7*10^6$	$3.4*10^4$, $1.6*10^4$, $1.6*10^4$	20.3 ± 2

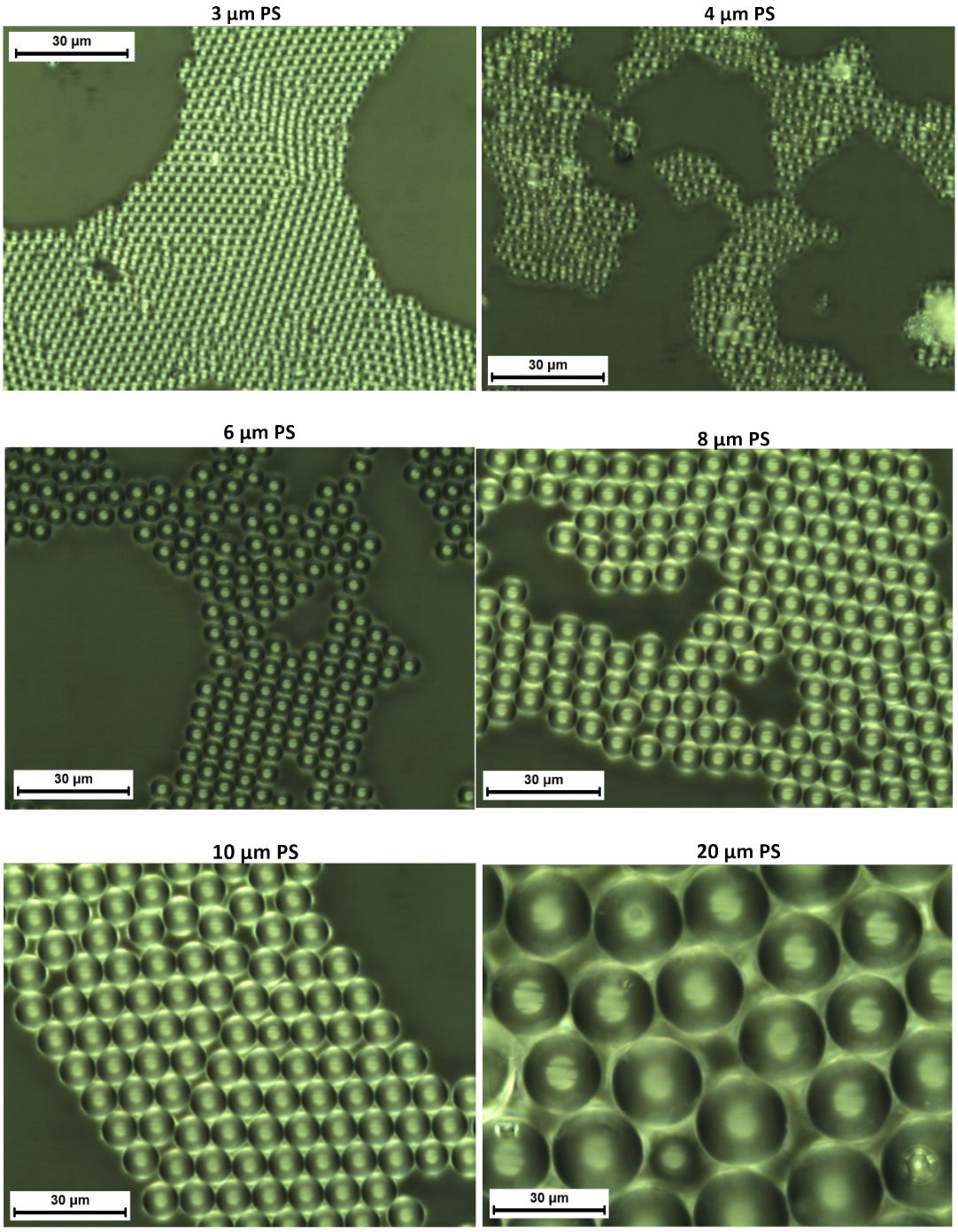

Figure S 1 Microscopic images of 4, 6, 8 and 10 µm PS particles.

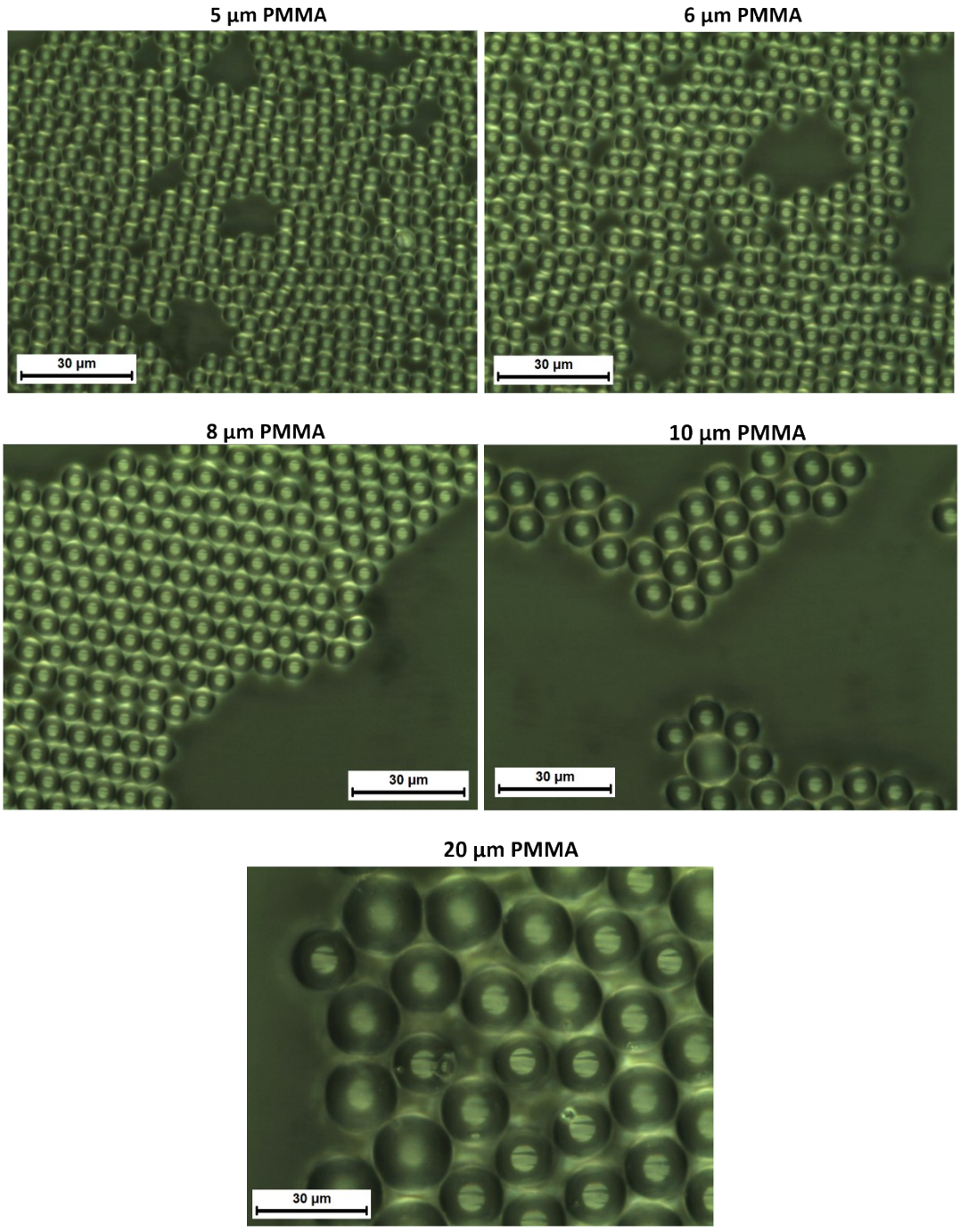

Figure S 2 Microscopic images of 6, 8 and 10 µm PMMA particles.

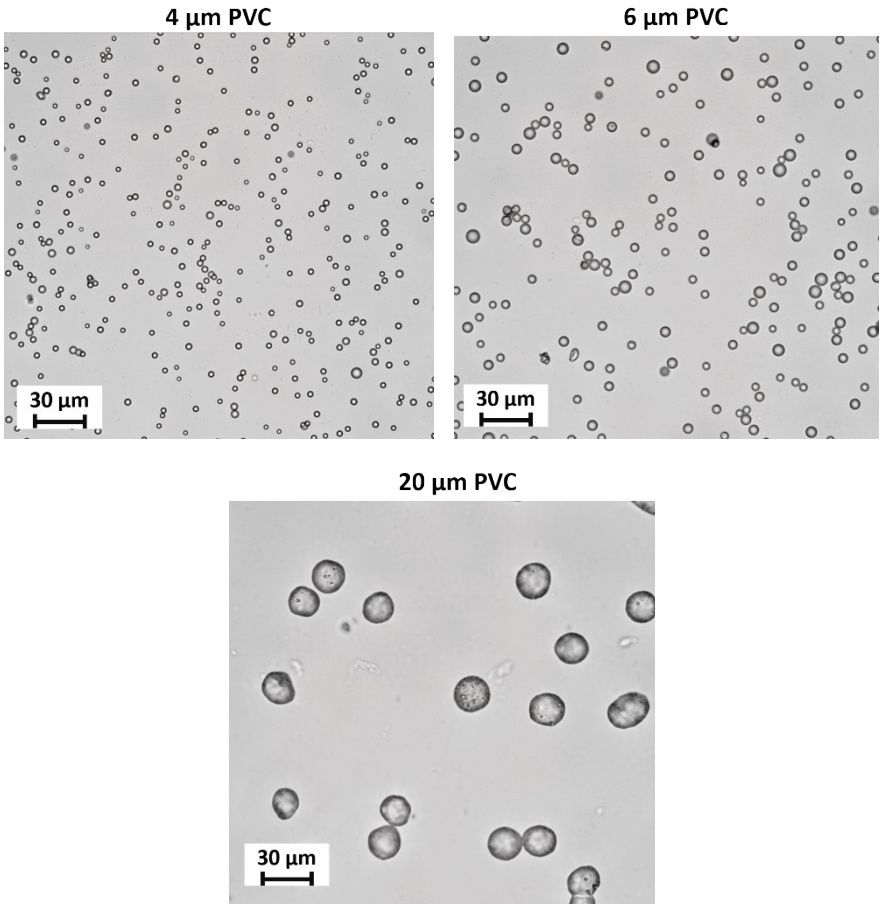

Figure S 3 Microscopic images of 4, 6 and 20 µm PVC particles.

Table S 2 Nominal and the determined particle sizes determined from the downward-pointing and the horizontal ICP-TOFMS.

Sample introduction configuration, Particle size [µm]				
Sample	Downward-pointing	Horizontal ICP		
		Cyclonic	HECIS	Falling-tube
3 µm PS	3.5 ± 0.5	2.9 ± 0.1	3.9 ± 0.1	3.1 ± 0.1
4 µm PS	4.0 ± 0.3	3.5 ± 0.1	4.1 ± 0.1	4.0 ± 0.2
6 µm PS	6.6 ± 0.3	5.9 ± 0.2	6.2 ± 0.1	6.0 ± 0.1
8 µm PS	8.5 ± 0.4	7.7	8.0 ± 0.3	8.4 ± 0.1
10 µm PS	10.6 ± 0.4	n.d.	10.3± 0.5	9.8 ± 0.3
20 µm PS	19.7 ± 2.4	n.d.	n.d.	19.9± 23.8
5 µm PMMA	5.4 ± 0.2	4.7 ± 0.3	5.4 ± 0.1	5.5 ± 0.1
6 µm PMMA	6.0 ± 0.2	5.8 ± 0.1	6.2 ± 0.3	6.0 ± 0.3
8 µm PMMA	7.7 ± 0.3	8.8	8.7 ± 0.2	7.7 ± 0.1
10 µm PMMA	10.2 ± 0.3	n.d.	10.6± 0.1	10.2 ± 0.2
20 µm PMMA	19.4 ± 1.4	n.d.	n.d.	19.9 ± 2.0
4 µm PVC	4.5 ± 0.4	3.3 ± 0.1	4.4 ± 0.2	4.3 ± 0.3
6 µm PVC	5.3 ± 1	4.7	5.8 ± 0.1	6.3 ± 0.3
20 µm PVC	20.3 ± 2	n.d.	n.d.	17.6 ± 0.3

Table S3 Transport efficiency of individual samples from the downward-ICP-TOFMS (setup A) and the falling-tube experiment (setup B2). The microplastics were suspended once in 2% HNO3 with/without 0.001% Tween20. The transport efficiency was once calculated based on the particle number concentration calculated from the reference value and once counted via optical microscopy.

	Transport efficiency [%]					
	According to reference				**According to microscopy**	
	2% HNO_3		**0.001% Tween20**		**0.001% Tween 20**	
Sample	**Downward**	**Falling-tube**	**Downward**	**Falling-tube**	**Downward**	**Falling-tube**
3 µm PS 1	22	41	81	38		
3 µm PS 2	133	31	92	8		
3 µm PS 3	97	31	70	9		
4 µm PS 1	42	23	30	104		
4 µm PS 2	156	36	23	33		
4 µm PS 3	18	17	15	23		
6 µm PS 1	56	57	127	106		
6 µm PS 2	123	60	111	98		
6 µm PS 3	51	62	87	79		
8 µm PS 1	69	49	76	86		
8 µm PS 2	94	62	71	97		
8 µm PS 3	88	55	113	29		
10 µm PS 1	75	90	205	286	103	143
10 µm PS 2	78	149	241	188	124	103
10 µm PS 3	116	132	195	195	155	155
20 µm PS 1	37	9	18	34		
20 µm PS 2	66	45	11	43		
20 µm PS 3	13	12	8	46		
5 µm PMMA 1	23	128	34	137		
5 µm PMMA 2	21	39	49	39		
5 µm PMMA 3	31	5	52	54		
6 µm PMMA 1	69	131	132	136		
6 µm PMMA 2	81	127	135	88		
6 µm PMMA 3	43	68	78	50		
8 µm PMMA 1	128	98	148	241	100	162

8 µm PMMA 2	95	83	114	63	113	62
8 µm PMMA 3	123	59	152	161	106	112
10 µm PMMA 1	105	150	205	18	103	9
10 µm PMMA 2	106	96	120	74	123	76
10 µm PMMA 3	45	305	151	140	77	71
20 µm PMMA 1	57	172	237	86	175	73
20 µm PMMA 2	115	193	111	73	141	107
20 µm PMMA 3	13	31	227	133	169	114
4 µm PVC 1	27	16	113	47		
4 µm PVC 2	28	7	104	110		
4 µm PVC 3	33	17	79	14		
6 µm PVC 1	101	21	72	45		
6 µm PVC 2	71	15	102	33		
6 µm PVC 3	35	4	58	18		
20 µm PVC 1	30	13	53	13		
20 µm PVC 2	64	20	55	20		
20 µm PVC 3	35	42	42	42		

Table S4 Counted particles and calculated particle number concentration of 3, 8 and 20 µm PS in 2% HNO_3 without/with 0.001% Tween 20. The particles were counted via optical microscopy.

Sample	**2% HNO_3**		**0.001% Tween 20**	
	Counted Particles	**Calculated PNC / mL^{-1}**	**Counted Particles**	**Calculated PNC / mL^{-1}**
3 µm PS 1	529	$4.8*10^8$	620	$5.6*10^8$
3 µm PS 2	400	$3.8*10^8$	557	$5.4*10^8$
3 µm PS 3	471	$4.5*10^8$	633	$6.1*10^8$
3 µm PS 4	492	$4.8*10^8$	566	$5.5*10^8$
3 µm PS 5	389	$3.9*10^8$	577	$5.8*10^8$
8 µm PS 1	281	$2.9*10^7$	1342	$1.4*10^8$
8 µm PS 2	291	$3.0*10^7$	431	$4.5*10^7$
8 µm PS 3	279	$2.9*10^7$	306	$3.1*10^7$

8 μm PS 4	310	$3.2*10^7$	704	$7.1*10^7$
8 μm PS 5	344	$3.4*10^7$	335	$3.4*10^7$
20 μm PS 1	44	$9.7*10^5$	22	$4.2*10^5$
20 μm PS 2	39	$8.1*10^5$	54	$1.1*10^6$
20 μm PS 3	63	$1.3*10^6$	64	$1.2*10^6$
20 μm PS 4	49	$1.0*10^6$	53	$1.1*10^6$
20 μm PS 5	77	$1.6*10^6$	22	$4.4*10^5$