Supporting information for the manuscript

"Concentrations and Adsorption Isotherms for Amphiphilic Surfactants in PM1 Aerosols from Different Regions of Europe"

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Table S1: List of experimental surfactants concentration and properties in PM_1 per sample in Rogoznica, Croatia; Lyon, France; and Pallas, Finland. The concentrations C surfactant (µg m^{-3}) were calculated assuming a surfactant molecular weight of 500 g mol^{-1}.

Rogoznica, Croatia

Day of year	dates	Sampled air volume (m^3)	C surfactant (µg m^{-3})				C surfactant (mM)				CMC (M)
			anionic	cationic	non-ionic	total	anionic	cationic	non-ionic	total	
33.5	02/02/15-d	212	9.1E-02	1.0E-03	4.8E-02	1.4E-01	13.8	0.2	7.2	21.1	5.3E-05
34.3	03/02/15-d	360	5.9E-02	2.9E-04	1.8E-02	7.8E-02	11.9	0.1	3.7	15.6	4.5E-05
34.8	03/02/15-n	360	3.1E-02	<DL	1.4E-02	4.6E-02	5.9	<DL	2.7	8.6	2.1E-04
35.3	04/02/15-d	360	2.9E-02	<DL	2.7E-03	3.2E-02	6.6	<DL	0.6	7.2	9.9E-05
35.8	04/02/15-n	360	2.8E-02	<DL	6.1E-03	3.4E-02	7.0	<DL	1.5	8.5	2.5E-04
36.3	05/02/15-d	360	3.2E-02	<DL	4.0E-03	3.6E-02	6.9	<DL	0.9	7.7	9.7E-05
36.8	05/02/15-n	360	9.3E-02	<DL	5.7E-03	9.9E-02	29.1	<DL	1.8	30.9	2.9E-04
37.3	06/02/15-d	360	8.8E-02	<DL	1.3E-02	1.0E-01	30.3	<DL	4.6	35.0	3.2E-04
37.8	06/02/15-n	360	6.0E-02	<DL	1.8E-02	7.8E-02	36.2	<DL	10.6	46.8	2.8E-04
38.3	07/02/15-d	360	6.6E-02	<DL	1.8E-03	6.8E-02	21.6	<DL	0.6	22.2	1.1E-04
38.8	07/02/15-n	360	8.7E-02	<DL	8.8E-03	9.6E-02	48.3	<DL	4.9	53.2	3.3E-04
39.3	08/02/15-d	360	8.0E-02	<DL	3.7E-03	8.3E-02	23.9	<DL	1.1	25.0	1.9E-04
39.8	08/02/15-n	360	7.5E-02	<DL	9.2E-03	8.4E-02	21.5	<DL	2.6	24.1	3.1E-04
40.3	09/02/15-d	360	2.9E-02	<DL	8.7E-03	3.7E-02	103.1	<DL	31.3	134.3	1.4E-04
40.8	09/02/15-n	360	3.9E-02	<DL	2.5E-03	4.2E-02	7.5	<DL	0.5	7.9	1.2E-04

d:day, n:night, <DL: below detection limit of the colorimetric method

Lyon, France

Day of year	dates	Sampled air volume (m^3)	C surfactant (µg m^{-3})				C surfactant (mM)				CMC (M)
			anionic	cationic	non-ionic	total	anionic	cationic	non-ionic	total	
335.5	01/12/14-d	365	1.6E-01	3.5E-03	4.1E-01	5.7E-01	19.5	0.4	52.0	72.0	3.4E-05
336.0	01/12/14-n	360	7.2E-02	2.6E-03	3.3E-01	4.0E-01	10.6	0.4	48.1	59.1	5.0E-05
336.5	02/12/14-d	360	1.1E-01	8.9E-03	5.0E-01	6.1E-01	8.9	0.8	42.4	52.1	8.2E-05
337.0	02/12/14-n	360	1.4E-01	5.0E-03	3.6E-01	5.0E-01	26.3	1.0	69.7	97.0	1.3E-04
337.5	03/12/14-d	360	2.5E-01	6.2E-03	6.4E-01	9.0E-01	25.6	0.6	64.7	90.9	1.0E-03
338.0	03/12/14-n	360	2.8E-01	3.1E-03	6.4E-01	9.3E-01	23.2	0.3	52.3	75.7	5.4E-04
338.5	04/12/14-d	360	3.1E-01	5.0E-03	6.9E-01	1.0E+00	23.8	0.4	53.1	77.3	8.7E-04
339.0	04/12/14-n	107	2.5E-01	2.1E-03	3.3E-01	5.8E-01	22.7	0.2	30.2	53.1	6.2E-04
339.5	05/12/14-d	360	2.3E-01	1.9E-03	6.0E-01	8.3E-01	32.7	0.3	84.3	117.3	1.4E-03
340.0	05/12/14-n	360	2.2E-01	1.0E-03	4.0E-01	6.1E-01	53.4	0.3	98.1	151.8	6.4E-04
340.5	06/12/14-d	360	2.0E-01	1.7E-03	4.9E-01	6.9E-01	39.1	0.3	95.7	135.1	1.4E-03
341.0	06/12/14-n	360	3.0E-01	1.2E-03	3.8E-01	6.8E-01	57.5	0.2	74.6	132.4	1.2E-03
341.5	07/12/14-d	360	2.4E-01	3.5E-03	6.9E-01	9.3E-01	42.3	0.6	124.0	166.9	2.2E-03
342.0	07/12/14-n	360	3.3E-01	4.3E-03	6.1E-01	9.4E-01	39.3	0.5	71.7	111.4	1.1E-03
342.8	08/12/14-n	63	1.3E+00	<DL	1.4E+00	2.8E+00	110.9	<DL	121.7	232.6	2.9E-03
343.8	09/12/14-n	360	2.5E-01	<DL	2.8E-01	5.3E-01	458.7	<DL	496.0	954.8	8.5E-03
344.3	10/12/14-d	206	3.7E-01	<DL	2.7E-01	6.5E-01	767.5	<DL	565.6	1333.1	6.2E-03
344.8	10/12/14-n	360	2.4E-01	6.8E-03	4.6E-01	7.1E-01	24.7	0.7	47.6	73.0	9.2E-03
345.3	11/12/14-d	360	2.1E-01	1.0E-01	1.6E-01	4.7E-01	16.0	7.8	12.3	36.1	7.0E-03
345.8	11/12/14-n	360	2.2E-01	9.4E-02	1.8E-01	4.9E-01	25.6	10.9	20.6	57.1	2.1E-03
346.3	12/12/14-d	360	2.9E-01	7.6E-03	1.6E-01	4.6E-01	20.6	0.5	11.2	32.3	1.7E-03
346.8	12/12/14-n	360	1.3E-01	0.0E+00	1.5E-01	2.9E-01	31.7	<DL	36.8	68.5	1.9E-03
347.3	13/12/14-d	360	1.6E-01	<DL	1.0E-01	2.6E-01	105.7	<DL	66.3	172.0	3.4E-04
347.8	13/12/14-n	360	7.2E-02	<DL	2.1E-01	2.8E-01	10.1	<DL	29.4	39.5	9.8E-04
348.3	14/12/14-d	360	1.4E-01	<DL	4.7E-01	6.1E-01	12.4	<DL	41.6	54.0	3.4E-03
348.8	14/12/14-n	360	1.9E-01	1.2E-01	4.1E-01	7.2E-01	15.1	9.1	31.9	56.0	3.4E-03

349.3	15/12/14-d	360	1.7E-01	7.6E-02	4.6E-01	7.0E-01	8.5	3.9	23.3	35.6	1.6E-03
349.8	15/12/14-n	360	2.0E-01	<DL	2.9E-01	4.9E-01	19.1	<DL	27.6	46.7	1.1E-03
350.3	16/12/14-d	360	5.4E-02	5.5E-02	2.4E-01	3.4E-01	4.5	4.6	20.0	29.2	1.4E-03
350.8	16/12/14-n	360	2.8E-01	<DL	3.8E-01	6.6E-01	25.9	<DL	35.1	61.1	7.1E-03
351.3	17/12/14-d	153	1.8E-01	<DL	7.1E-01	8.9E-01	8.0	<DL	32.6	40.6	3.1E-03
12.8	12/01/15-n	360	4.6E-01	7.1E-03	1.9E+00	2.4E+00	27.3	0.4	115.4	143.1	7.0E-04
13.3	13/01/15-d	360	1.6E-01	2.2E-03	4.1E-01	5.7E-01	13.0	0.2	33.8	46.9	1.1E-03
13.8	13/01/15-n	360	2.0E-01	1.5E-03	2.4E-01	4.4E-01	81.1	0.6	95.8	177.5	3.6E-04
14.3	14/01/15-d	360	8.3E-02	1.3E-03	2.6E-01	3.4E-01	3.1	0.05	9.6	12.8	5.5E-04
14.8	14/01/15-n	360	2.0E-01	5.8E-03	6.8E-01	8.9E-01	20.2	0.6	69.1	89.9	1.2E-03
15.3	15/01/15-d	360	9.7E-02	9.6E-04	2.1E-01	3.1E-01	77.8	0.8	169.1	247.6	4.1E-04
15.8	15/01/15-n	360	9.4E-02	1.1E-03	1.5E-01	2.4E-01	15.4	0.2	24.0	39.6	3.4E-04
17.3	17/01/15-d	360	5.4E-02	1.1E-03	2.3E-01	2.8E-01	4.3	0.1	18.0	22.4	5.1E-04
17.8	17/01/15-n	360	2.7E-01	4.9E-03	1.2E+00	1.4E+00	59.8	1.1	260.5	321.5	2.3E-03
18.3	18/01/15-d	360	2.9E-01	2.0E-03	6.8E-01	9.7E-01	48.9	0.3	116.4	165.6	1.8E-03
18.8	18/01/15-n	295	3.5E-01	1.2E-03	1.1E+00	1.4E+00	67.3	0.2	207.2	274.7	2.4E-03
19.3	19/01/15-d	72	4.7E-01	4.0E-03	9.8E-01	1.5E+00	17.8	0.2	37.3	55.2	1.1E-03

d:day, n:night, <DL: below detection limit of the colorimetric method

Pallas, Finland

Day of year	dates	Sampled volume (m^3)	C surfactant ($\mu g\ m^{-3}$)				C surfactant (mM)				CMC (M)
			anionic	cationic	non-ionic	total	anionic	cationic	non-ionic	total	
112.0	22-23/04/15	720	3.3E-02	<DL	3.4E-03	3.7E-02	102.5	<DL	10.4	113.0	3.2E-04
114.0	24/04/15	720	9.4E-03	<DL	9.3E-03	1.9E-02	5.7	<DL	5.6	11.3	2.5E-04
115.0	25-26/04/15	1440	6.6E-03	2.6E-04	6.2E-03	1.3E-02	4.5	0.2	4.3	9.0	1.4E-04
117.0	27/04/15	600	1.3E-02	<DL	1.2E-02	2.5E-02	7.5	<DL	7.5	15.0	1.7E-04
121.0	01/05/15	450	3.3E-02	9.8E-04	2.3E-02	5.7E-02	32.9	1.0	23.4	57.3	1.2E-04
125.0	05-06/05/15	1440	2.1E-02	2.2E-04	1.9E-02	4.0E-02	14.5	0.2	13.0	27.7	2.4E-04
127.0	07/05/15	120	9.8E-02	2.2E-03	4.7E-02	1.5E-01	46.8	1.1	22.4	70.3	1.5E-04
128.0	08/05/15	330	2.7E-02	<DL	1.7E-02	4.4E-02	13.4	<DL	8.2	21.6	5.7E-05
129.0	09/05/15	450	1.1E-01	8.0E-04	1.2E-02	1.3E-01	96.1	0.7	10.0	106.9	1.2E-04
131.0	11/05/15	720	2.2E-02	3.2E-04	7.9E-03	3.0E-02	45.6	0.7	16.3	62.6	1.2E-04
132.0	12/05/15	720	1.7E-02	3.6E-04	1.1E-02	2.9E-02	21.1	0.4	13.4	35.0	1.4E-04
133.0	13/05/15	720	2.1E-02	3.0E-04	9.7E-03	3.1E-02	22.8	0.3	10.6	33.7	3.0E-04
134.0	14/05/15	330	6.5E-02	6.2E-04	1.4E-02	7.9E-02	49.7	0.5	10.6	60.8	1.6E-04
136.0	16-17/05/15	720	9.6E-03	2.7E-04	3.0E-03	1.3E-02	6.6	0.2	2.1	8.9	1.1E-04
138.0	18-19/05/15	1095	1.6E-02	3.6E-04	7.4E-03	2.4E-02	7.2	0.2	3.2	10.6	1.3E-04
140.0	20-21/05/15	1440	1.8E-02	3.8E-04	5.7E-03	2.4E-02	34.6	0.7	11.1	46.5	1.2E-04
142.0	22/05/15	720	1.5E-02	7.1E-04	9.1E-03	2.5E-02	22.7	1.1	13.9	37.7	1.5E-04
143.0	23/05/15	480	2.0E-02	<DL	1.9E-02	3.9E-02	128.0	<DL	121.9	249.9	1.2E-04
144.0	24/05/15	720	1.0E-02	<DL	1.1E-03	1.1E-02	63.1	<DL	6.9	70.0	2.2E-04
145.0	25-26/05/15	1440	8.5E-03	3.5E-04	4.4E-03	1.3E-02	15.2	0.6	8.0	23.8	2.1E-04
147.0	27/05/15	540	2.6E-02	<DL	9.8E-03	3.5E-02	17.2	<DL	6.6	23.7	1.5E-04
148.0	28/05/15	360	3.1E-02	1.3E-03	1.4E-02	4.7E-02	87.4	3.5	41.0	132.0	6.0E-05
149.0	29-30/05/15	1440	1.6E-02	1.6E-04	9.9E-03	2.6E-02	20.8	0.2	13.2	34.2	1.9E-04
151.0	31/05-01/06/15	1440	1.9E-02	2.4E-04	1.4E-02	3.3E-02	16.8	0.2	13.1	30.2	1.7E-04
153.0	02-03/06/15	1440	1.4E-02	<DL	9.2E-03	2.3E-02	20.4	<DL	13.3	33.8	2.3E-04
155.0	04-05/06/15	1440	2.7E-03	6.9E-05	3.7E-03	6.5E-03	13.5	0.3	19.0	32.9	8.2E-05
157.0	06-07/06/15	1440	8.0E-03	1.6E-04	8.3E-03	1.6E-02	16.3	0.3	16.7	33.3	2.1E-04
159.0	08-09-10/06/15	2160	4.3E-03	<DL	7.5E-03	1.2E-02	19.3	<DL	34.2	53.5	1.4E-04
164.0	13/06/15	720	6.8E-03	1.4E-04	3.2E-03	1.0E-02	31.0	0.7	14.7	46.3	
165.0	14/06/15	720	3.0E-03	4.4E-04	9.9E-03	1.3E-02	9.3	1.4	30.6	41.3	
166.0	15/06/15	720	1.9E-02	3.0E-04	2.3E-02	4.3E-02	26.9	0.4	32.4	59.7	
167.0	16/06/15	720	2.6E-02	3.0E-04	2.2E-02	4.8E-02	40.8	0.5	34.4	75.6	
168.0	17/06/15	720	1.3E-02	<DL	1.2E-02	2.5E-02	27.5	<DL	24.3	51.9	

170.0	19/06/15	720	1.3E-02	<DL	1.5E-02	2.8E-02	20.5	<DL	23.1	43.6	
171.0	20/06/15	720	2.1E-02	3.4E-04	1.5E-02	3.7E-02	40.0	0.7	29.1	69.8	
172.0	21/06/15	720	2.9E-02	0.0E+00	2.3E-02	5.2E-02	27.3	0.0	22.1	49.4	3.4E-04
173.0	22/06/15	720	5.2E-02	2.7E-04	5.0E-02	1.0E-01	21.8	0.1	21.3	43.2	6.1E-04
174.0	23/06/15	720	3.3E-02	3.7E-04	4.2E-02	7.5E-02	11.4	0.1	14.4	26.0	3.7E-04
175.0	24/06/15	720	1.9E-02	5.3E-04	2.7E-02	4.7E-02	32.1	0.9	45.0	78.0	1.8E-04
176.0	25/06/15	720	2.1E-02	2.4E-04	2.9E-02	5.1E-02	16.9	0.2	23.4	40.6	1.3E-04
181.0	30/06/15	720	7.6E-03	1.7E-04	1.2E-02	2.0E-02	13.9	0.3	22.8	37.0	
182.0	01/07/15	720	2.1E-02	<DL	1.6E-02	3.7E-02	18.2	<DL	13.9	32.1	
183.0	02/07/15	720	2.8E-02	<DL	2.2E-02	5.0E-02	12.9	<DL	10.2	23.1	
184.0	03/07/15	720	2.2E-02	2.9E-04	2.5E-02	4.6E-02	14.8	0.2	16.9	31.9	
185.0	04/07/15	720	6.6E-03	2.6E-04	2.6E-02	3.3E-02	9.0	0.4	36.1	45.5	
186.0	05/07/15	720	1.0E-02	7.6E-04	1.8E-02	2.9E-02	13.6	1.0	23.7	38.3	
187.0	06/07/15	720	1.3E-02	<DL	2.1E-02	3.4E-02	15.8	<DL	26.7	42.5	
188.0	07/07/15	720	1.1E-02	1.7E-04	1.6E-02	2.7E-02	18.4	0.3	27.6	46.3	1.2E-04
189.0	08/07/15	720	2.6E-02	3.5E-04	5.5E-02	8.1E-02	14.0	0.2	29.4	43.5	
190.0	09/07/15	720	3.9E-02	4.7E-04	5.3E-02	9.3E-02	10.1	0.1	13.7	24.0	
194.0	13/07/15	720	8.9E-03	4.3E-04	1.7E-02	2.6E-02	5.8	0.3	10.9	17.1	
195.0	14/07/15	720	1.1E-02	3.0E-04	2.3E-02	3.4E-02	8.4	0.2	18.4	27.0	
196.0	15/07/15	720	1.3E-02	2.8E-04	2.2E-02	3.6E-02	16.0	0.3	27.6	43.9	
197.0	16-17/07/15	1440	2.4E-02	3.7E-04	2.4E-02	4.8E-02	11.3	0.2	11.4	22.9	2.5E-04
199.0	18/07/15	720	2.7E-02	5.0E-04	3.1E-02	5.8E-02	9.5	0.2	10.9	20.6	4.7E-04
200.0	19/07/15	720	2.9E-02	3.0E-04	3.3E-02	6.2E-02	12.4	0.1	14.4	26.9	3.7E-04
201.0	20/07/15	720	1.2E-02	<DL	1.8E-02	2.9E-02	17.0	<DL	25.9	42.9	1.3E-04
202.0	21/07/15	720	2.9E-02	4.6E-04	2.9E-02	5.9E-02	16.2	0.3	16.2	32.6	2.3E-04
203.0	22/07/15	720	3.5E-02	4.2E-04	4.0E-02	7.6E-02	11.1	0.1	12.8	24.1	3.0E-04
204.0	23/07/15	720	3.7E-02	3.5E-04	3.8E-02	7.5E-02	6.8	0.1	7.2	14.1	3.8E-04
205.0	24/07/15	720	3.1E-02	2.6E-04	5.0E-02	8.1E-02	10.6	0.1	17.4	28.1	8.2E-04
206.0	25/07/15	720	3.0E-02	1.7E-04	4.0E-02	7.0E-02	13.5	0.1	17.6	31.2	5.4E-04
207.0	26/07/15	720	2.0E-02	<DL	2.3E-02	4.3E-02	15.3	<DL	17.4	32.7	1.6E-04
208.0	27/07/15	720	1.8E-02	3.0E-04	1.5E-02	3.4E-02	43.4	0.7	35.8	79.9	1.5E-04
209.0	28/07/15	720	2.4E-02	4.3E-04	2.5E-02	4.9E-02	11.8	0.2	12.3	24.4	1.7E-04
210.0	29-30/07/15	1440	1.2E-02	5.0E-04	1.7E-02	3.0E-02	16.0	0.7	23.9	40.6	8.7E-05
212.0	31/07/15	720	2.7E-02	2.7E-04	2.6E-02	5.3E-02	13.2	0.1	12.5	25.9	1.6E-04
213.0	01/08/15	720	2.3E-02	5.7E-04	2.2E-02	4.6E-02	13.5	0.3	12.9	26.7	2.6E-04
214.0	02/08/15	720	4.6E-03	1.1E-03	1.5E-02	2.1E-02					1.4E-04
220.0	08/08/15	720	2.0E-02	4.0E-04	2.1E-02	4.2E-02					1.5E-04
224.0	12/08/15	720	2.1E-02	4.7E-04	2.2E-02	4.3E-02	20.8	0.5	21.6	42.8	2.1E-04
234.0	22/08/15	720	5.7E-02	3.3E-04	9.4E-02	1.5E-01	15.9	0.1	26.5	42.4	
235.0	23/08/15	720	4.1E-02	3.9E-04	4.9E-02	9.0E-02	12.0	0.1	14.4	26.5	4.0E-04
236.0	24/08/15	720	3.2E-02	2.2E-04	3.3E-02	6.5E-02	11.5	0.1	12.0	23.6	
237.0	25/08/15	720	2.2E-02	3.9E-04	6.0E-02	8.3E-02	12.2	0.2	33.5	46.0	2.1E-04
238.0	26/08/15	720	2.3E-02	2.1E-04	2.6E-02	4.9E-02	11.1	0.1	12.3	23.5	1.7E-04
239.0	27/08/15	720	1.8E-02	2.1E-04	2.0E-02	3.8E-02	12.6	0.1	13.7	26.4	1.5E-04
240.0	28/08/15	720	1.1E-02	3.9E-04	5.3E-02	6.5E-02	17.9	0.6	84.1	102.6	1.3E-04
241.0	29/08/15	720	7.1E-03	2.0E-04	2.0E-02	2.7E-02	24.0	0.7	67.1	91.8	1.5E-04
242.0	30/08/15	720	7.1E-03	<DL	1.7E-02	2.4E-02	15.2	<DL	37.3	52.5	
244.0	01/09/15	720	7.9E-04	5.3E-04	1.1E-02	1.3E-02	8.2	5.5	118.9	132.6	
245.0	02/09/15	720	1.1E-02	<DL	1.7E-02	2.8E-02	29.8	<DL	44.5	74.3	
246.0	03/09/15	720	1.2E-02	<DL	1.4E-02	2.6E-02	18.6	<DL	22.1	40.8	3.0E-04
247.0	04/09/15	720	1.2E-02	<DL	1.3E-02	2.5E-02	29.3	<DL	32.5	61.8	2.9E-04
248.0	05/09/15	720	2.1E-02	4.7E-04	1.7E-02	3.9E-02	39.4	0.9	31.8	72.2	1.7E-04
249.0	06/09/15	720	1.4E-02	5.0E-04	1.7E-02	3.1E-02	59.3	2.1	72.9	134.3	1.4E-04
250.0	07/09/15	720	4.9E-03	3.8E-04	9.0E-03	1.4E-02	28.4	2.2	52.0	82.6	2.5E-04
251.0	08/09/15	720	2.6E-03	<DL	1.3E-02	1.6E-02	9.7	<DL	49.4	59.1	
259.0	16/09/15	720	4.9E-02	2.4E-04	2.8E-02	7.7E-02	17.8	0.1	10.2	28.1	

260.0	17/09/15	720	3.2E-02	1.3E-03	4.3E-02	7.6E-02	23.2	0.9	31.2	55.3	1.5E-04
261.0	18/09/15	720	1.4E-03	5.7E-05	1.7E-02	1.8E-02	2.9	0.1	35.3	38.3	
262.0	19/09/15	720	1.9E-03	8.6E-04	1.3E-02	1.6E-02	14.9	6.6	99.2	120.8	
263.0	20/09/15	720	8.0E-03	8.4E-04	1.7E-02	2.6E-02	42.4	4.5	92.0	138.9	
264.0	21/09/15	720	6.8E-03	6.3E-04	2.0E-02	2.8E-02	10.4	1.0	31.1	42.5	
265.0	22/09/15	720	2.1E-02	7.9E-04	1.6E-02	3.7E-02	18.2	0.7	13.8	32.8	
266.0	23/09/15	720	3.3E-02	9.0E-04	1.3E-02	4.7E-02	81.7	2.3	32.8	116.7	
267.0	24/09/15	720	3.3E-02	8.4E-04	1.4E-02	4.7E-02	48.8	1.3	20.5	70.6	
268.0	25/09/15	720	2.7E-02	1.2E-03	2.1E-02	4.9E-02	8.9	0.4	6.7	16.0	
269.0	26/09/15	720	4.9E-03	7.0E-04	1.0E-02	1.6E-02	18.7	2.6	39.3	60.6	
270.0	27/09/15	720	1.4E-02	9.3E-04	1.0E-02	2.5E-02	29.1	1.9	21.0	52.1	2.3E-04
272.0	29/09/15	720	9.8E-03	5.3E-04	1.1E-02	2.1E-02	19.4	1.0	21.0	41.4	2.6E-04
273.0	30/09/15	720	6.2E-03	2.0E-04	8.1E-03	1.4E-02	17.1	0.6	22.6	40.3	
274.0	01/10/15	720	5.4E-03	3.2E-04	9.7E-03	1.6E-02	47.4	2.8	84.9	135.1	
275.0	02/10/15	720	6.3E-03	6.2E-04	8.5E-03	1.5E-02	51.8	5.1	69.9	126.8	
276.0	03/10/15	720	7.9E-03	6.3E-04	1.2E-02	2.0E-02	84.4	6.7	126.0	217.1	
288.0	15/10/15	720	1.1E-02	<DL	1.2E-02	2.3E-02	28.2	<DL	32.7	60.8	2.5E-04
289.0	16/10/15	720	1.1E-02	<DL	5.3E-03	1.7E-02	57.7	<DL	26.6	84.3	
290.0	17/10/15	720	5.9E-03	<DL	1.3E-02	1.9E-02	65.0	<DL	140.1	205.1	
291.0	18/10/15	720	<DL	1.4E-04	8.7E-03	8.8E-03	<DL	1.9	119.7	121.6	
292.0	19/10/15	720	4.2E-03	2.1E-04	1.2E-02	1.7E-02	26.0	1.3	75.5	102.8	
293.0	20/10/15	720	8.1E-03	<DL	8.7E-03	1.7E-02	55.5	<DL	60.3	115.8	
294.0	21/10/15	720	4.7E-03	4.9E-04	6.7E-03	1.2E-02	46.9	4.8	66.8	118.6	9.5E-05
295.0	22/10/15	720	0.0E+00	9.2E-05	8.5E-03	8.6E-03	0.0	2.5	228.1	230.5	
296.0	23/10/15	720	0.0E+00	1.4E-04	7.8E-03	7.9E-03	0.0	3.2	178.2	181.4	
297.0	24/10/15	720	4.4E-03	2.5E-04	1.3E-02	1.8E-02	27.4	1.6	82.0	111.0	
298.0	25/10/15	720	1.5E-02	5.2E-04	2.1E-02	3.7E-02	46.6	1.6	65.3	113.5	1.3E-04
299.0	26/10/15	720	2.2E-04	3.8E-04	1.7E-02	1.8E-02	1.5	2.5	113.3	117.3	
301.0	28/10/15	720	1.5E-03	1.8E-04	7.7E-03	9.3E-03	12.9	1.6	66.9	81.4	
302.0	29/10/15	720	5.8E-03	<DL	7.7E-03	1.3E-02	42.6	<DL	56.5	99.2	
303.0	30/10/15	720	1.6E-02	<DL	1.3E-02	2.9E-02	81.6	<DL	64.2	145.8	
304.0	31/10/15	720	6.5E-03	1.7E-04	1.3E-02	2.0E-02	24.8	0.7	50.1	75.6	
305.0	01/11/15	720	1.5E-02	<DL	8.4E-03	2.3E-02	71.4	<DL	40.4	111.8	
306.0	02/11/15	720	1.6E-02	4.4E-04	1.2E-02	2.8E-02	41.2	1.1	30.6	72.9	3.0E-04
307.0	03/11/15	720	2.2E-02	2.9E-04	9.5E-03	3.2E-02	96.0	1.3	42.2	139.5	
308.0	04/11/15	720	2.0E-03	3.2E-04	1.0E-02	1.3E-02	10.2	1.7	53.9	65.8	
309.0	05/11/15	720	6.3E-03	<DL	7.4E-03	1.4E-02	47.2	<DL	55.7	102.9	
310.0	06/11/15	720	5.6E-03	<DL	8.6E-03	1.4E-02	56.0	<DL	86.0	142.0	
311.0	07/11/15	720	4.8E-03	1.5E-04	1.6E-02	2.1E-02	37.8	1.2	128.8	167.8	8.8E-05
312.0	08/11/15	720	<DL	1.2E-04	7.8E-03	7.9E-03	<DL	7.4	501.9	509.3	
313.0	09/11/15	720	<DL	3.5E-04	8.8E-03	9.1E-03	<DL	36.5	910.2	946.7	
314.0	10/11/15	720	4.8E-03	5.0E-04	1.3E-02	1.8E-02	299.8	30.9	779.7	1110.4	
315.0	11/11/15	720	6.7E-03	3.6E-04	6.9E-03	1.4E-02	25.2	1.4	26.0	52.6	7.9E-05
316.0	12/11/15	720	8.8E-03	6.8E-05	1.3E-02	2.2E-02	19.4	0.2	28.2	47.8	9.3E-05
317.0	13/11/15	720	1.1E-02	<DL	1.4E-02	2.5E-02	23.7	<DL	30.5	54.2	
318.0	14/11/15	720	8.1E-04	7.9E-04	4.0E-03	5.6E-03	13.5	13.2	67.2	93.8	6.8E-05
320.0	16/11/15	810	9.0E-03	5.8E-04	1.0E-02	2.0E-02	14.4	0.9	16.5	31.9	1.0E-04
322.0	18/11/15	720	1.3E-02	<DL	1.5E-02	2.8E-02	22.6	<DL	25.2	47.8	
323.0	19/11/15	720	1.8E-02	<DL	1.6E-02	3.4E-02	26.9	<DL	23.2	50.1	
324.0	20/11/15	720	2.1E-03	1.0E-04	1.2E-02	1.4E-02	8.3	0.4	45.9	54.7	
326.0	22/11/15	720	1.4E-03	4.6E-04	7.3E-03	9.1E-03	5.1	1.7	26.2	32.9	
327.0	23/11/15	720	4.6E-03	1.6E-03	6.1E-03	1.2E-02	35.9	12.6	46.9	95.3	
328.0	24/11/15	720	9.9E-03	3.1E-03	9.2E-03	2.2E-02	62.3	19.7	57.6	139.5	

<DL: below detection limit of the colorimetric method

Figure S1: Correlations between anionic and non-ionic surfactants in PM_1: A) Rogoznica, Croatia (15 samples), B) Lyon, France (43 samples); C) Pallas, Finland (142 samples).

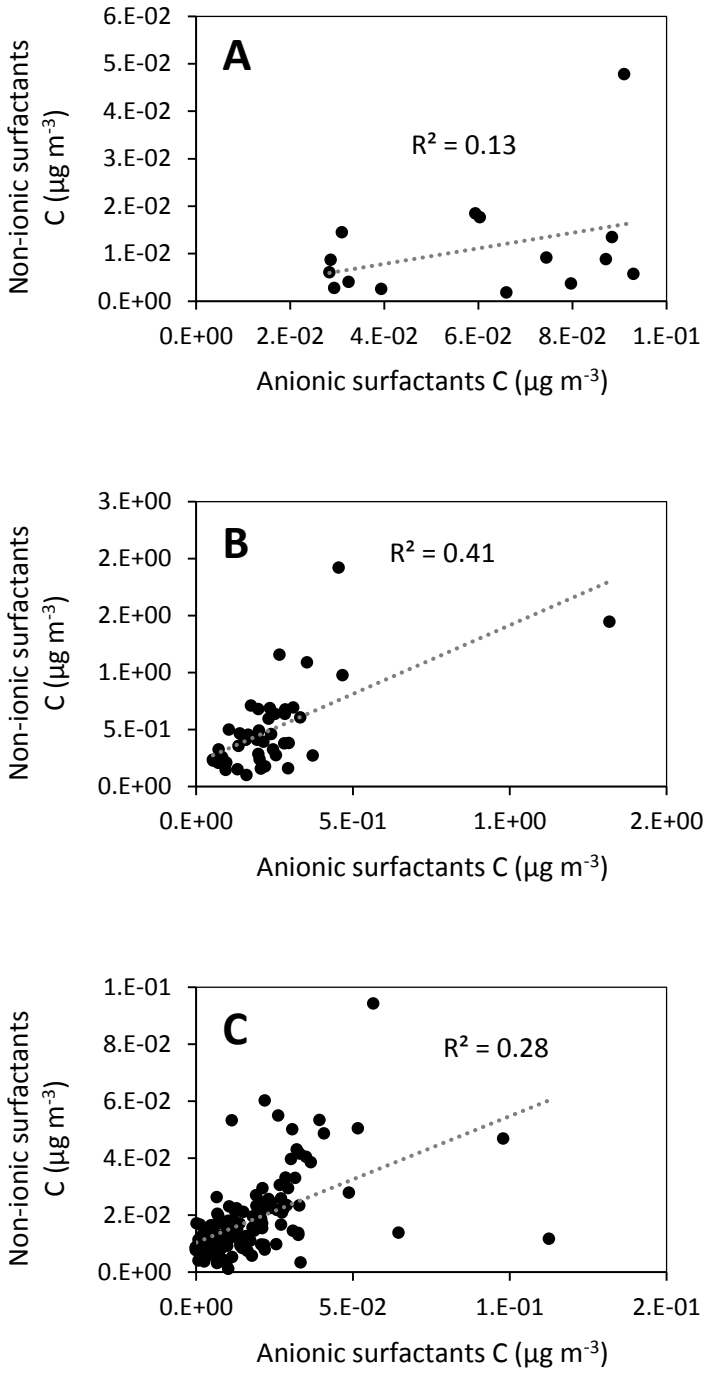

Figure S2: Example of typical PM_1 number particles concentration (cm^{-3}), surface concentration (m^2 cm^{-3}) and volume concentration (m^3 cm^{-3}) at Pallas site, Finland (here, data from 26/10/2015 9:00 UTC+2).

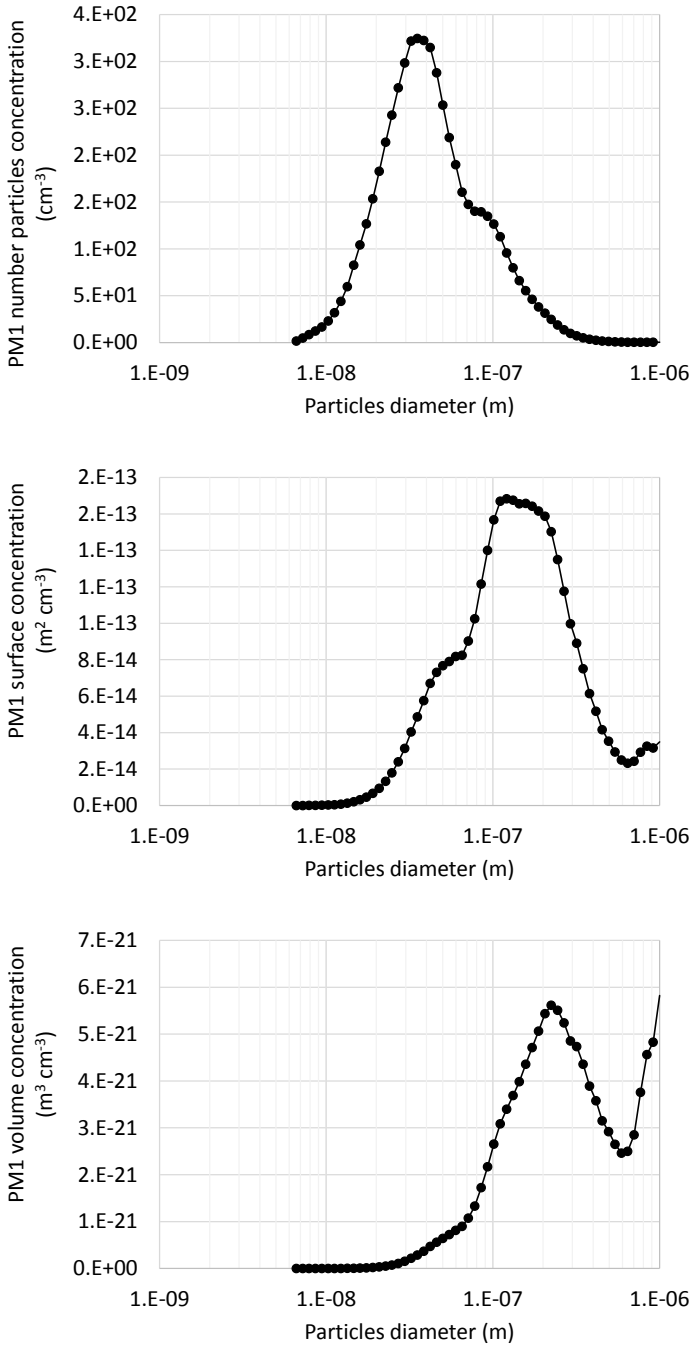

Figure S3: PM_1 mass concentrations (in µg m^{-3}) in A) Rogoznica, Croatia, B) Lyon, France and C) Pallas, Finland, and D) PM_1 surface concentrations (in cm^2 cm^{-3}) in Pallas, and E) PM_1 number concentrations (in cm^{-3}) in Pallas.

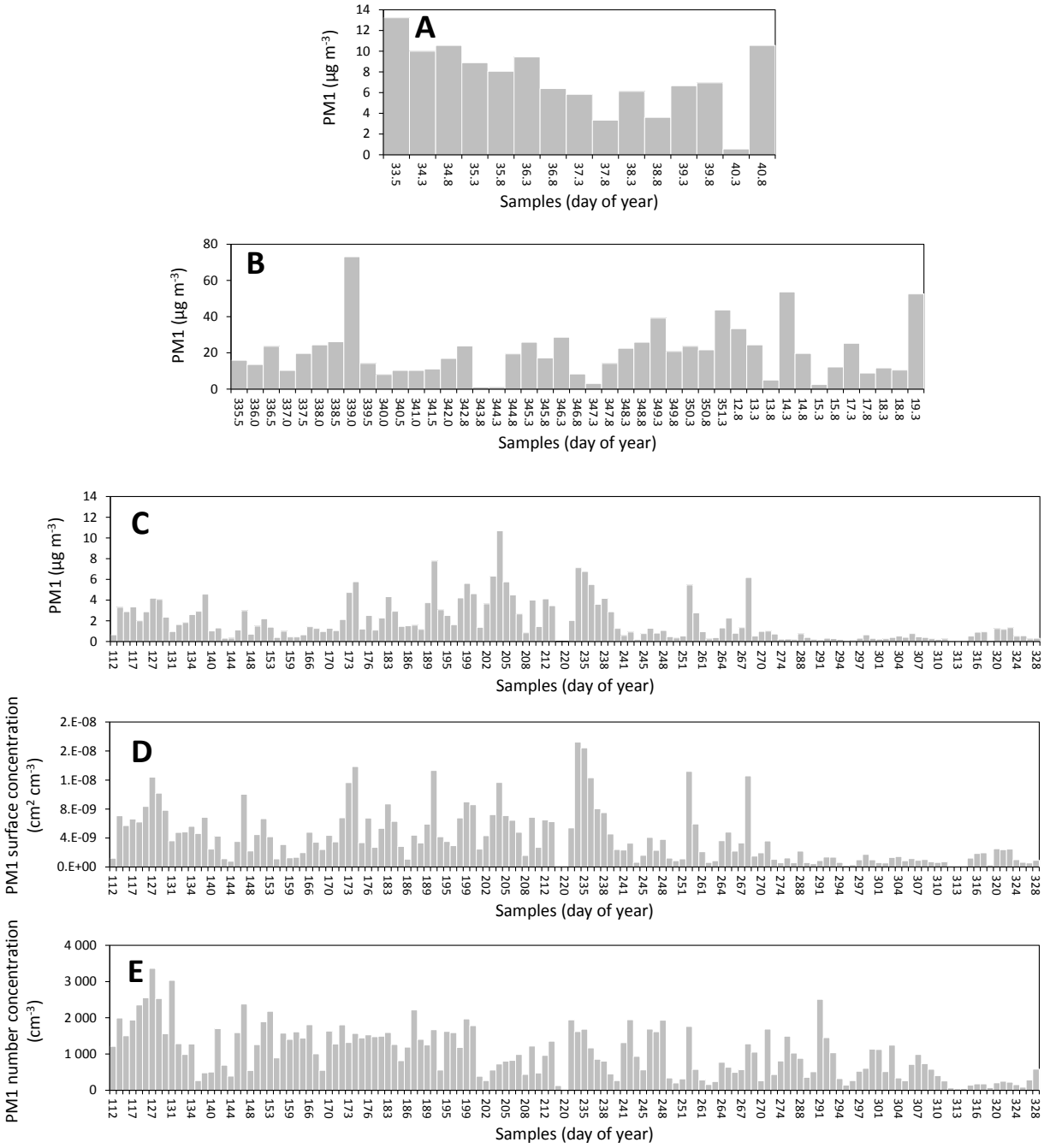

Figure S4: Correlations between A) total, B) anionic and C) non-ionic surfactant concentrations and PM_1 surface concentration ($cm^2\ cm^{-3}$) in Pallas, Finland (142 samples).

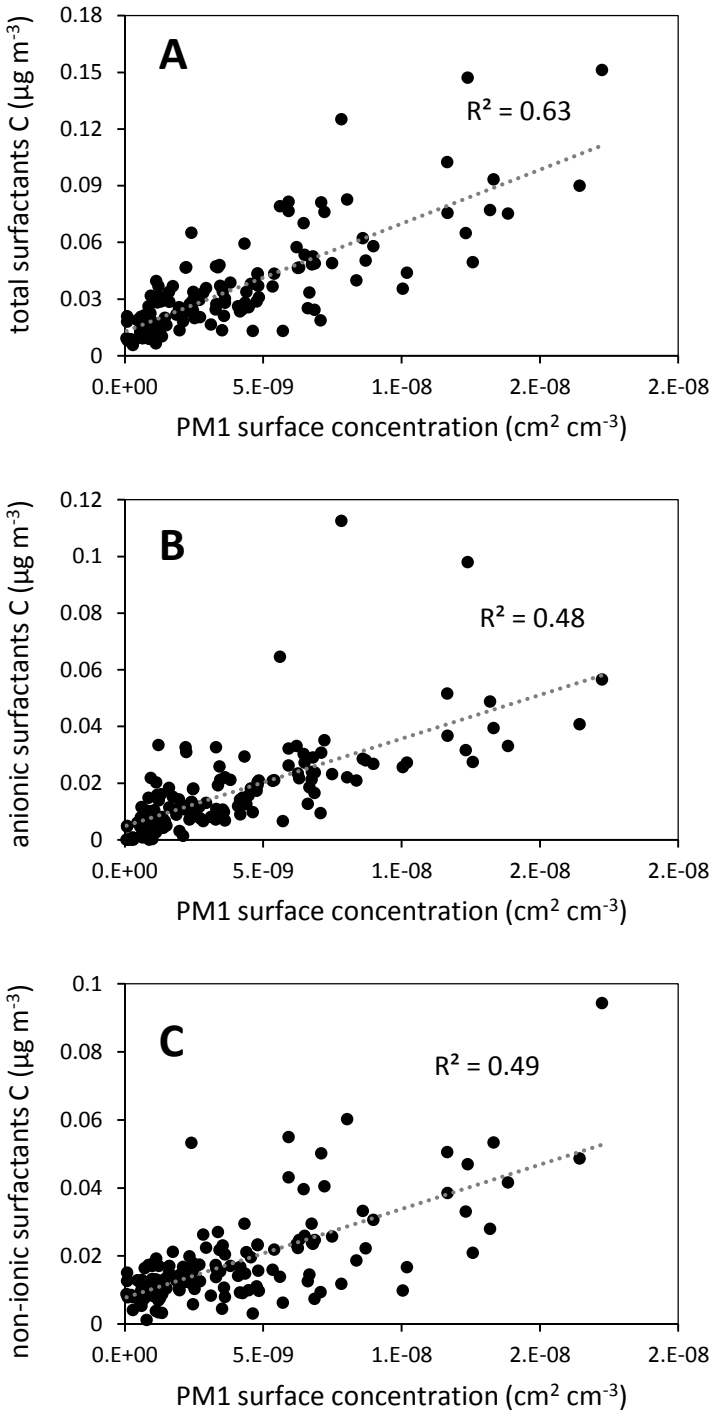

Figure S5: Correlations between the PM1 chemical fractions measured by ACSM and the surfactant concentrations in Pallas over 10-11/2015 (30 samples) A) in µg m^{-3} and B) in M or mM.

A)

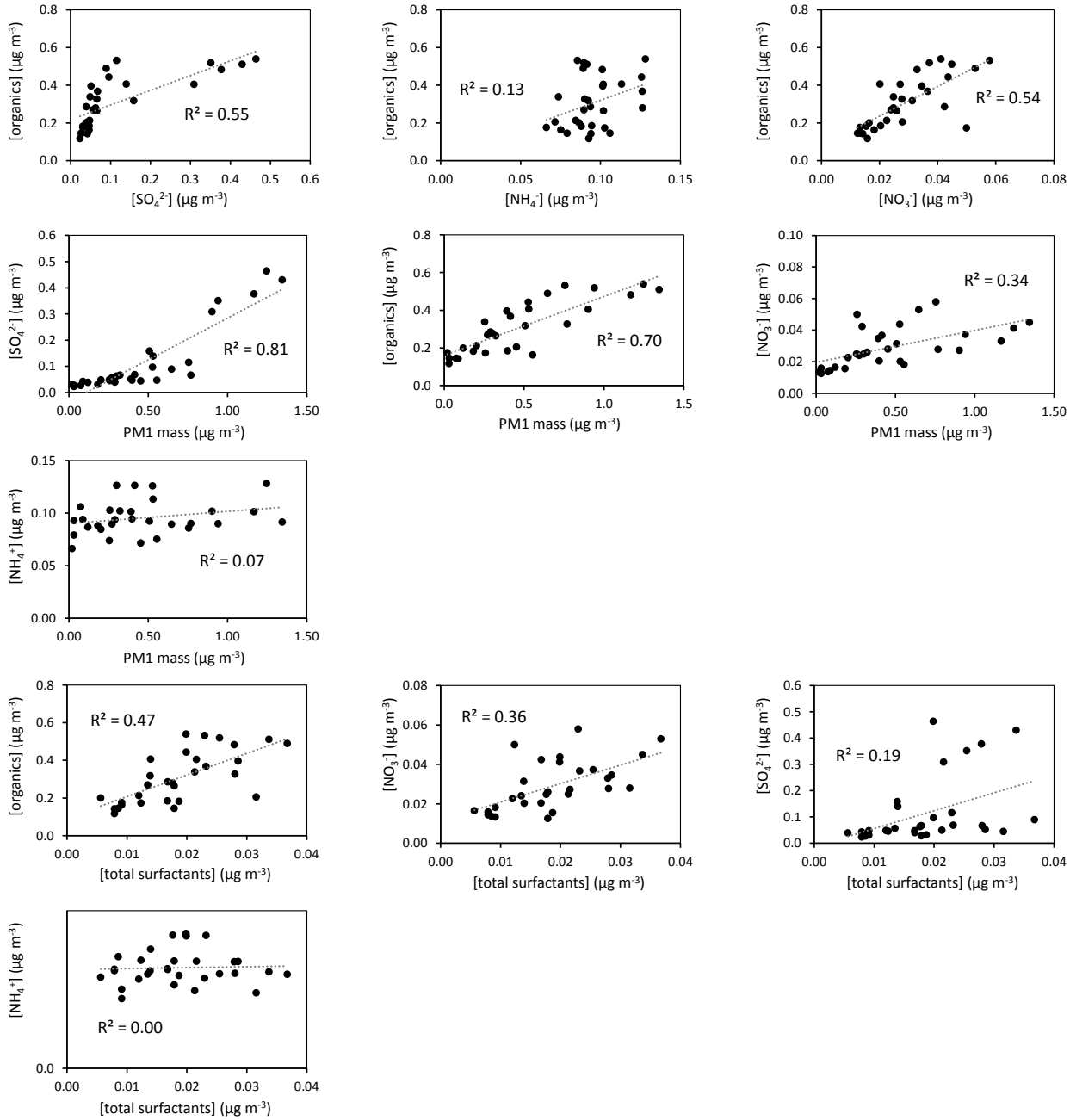

Figure S5 (continued)

B)

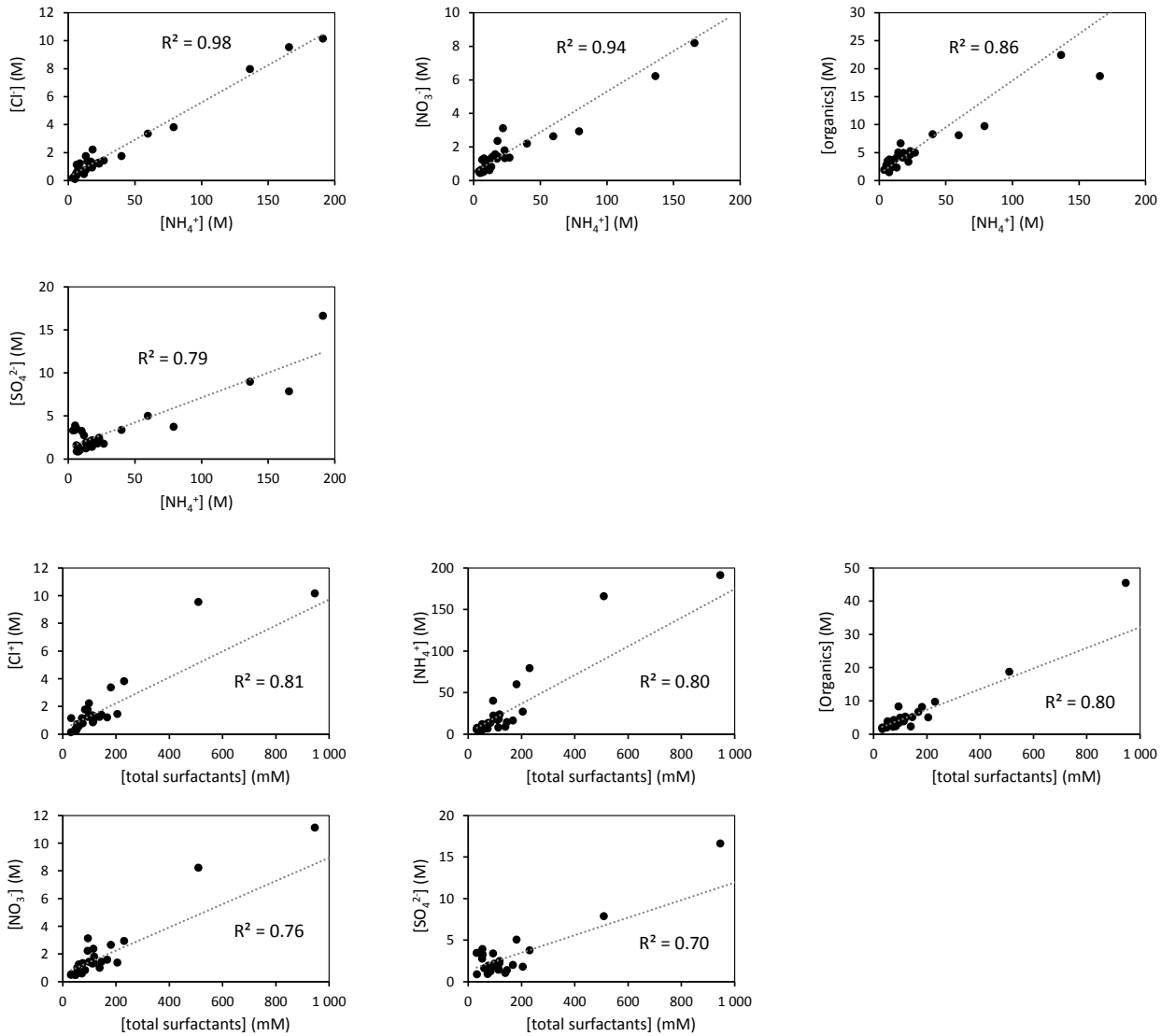

Figure S6: CMC for the amphiphilic surfactants extracted from the PM_1 samples. A) Rogoznica, Croatia; B) Lyon, France; C) Pallas, Finland.

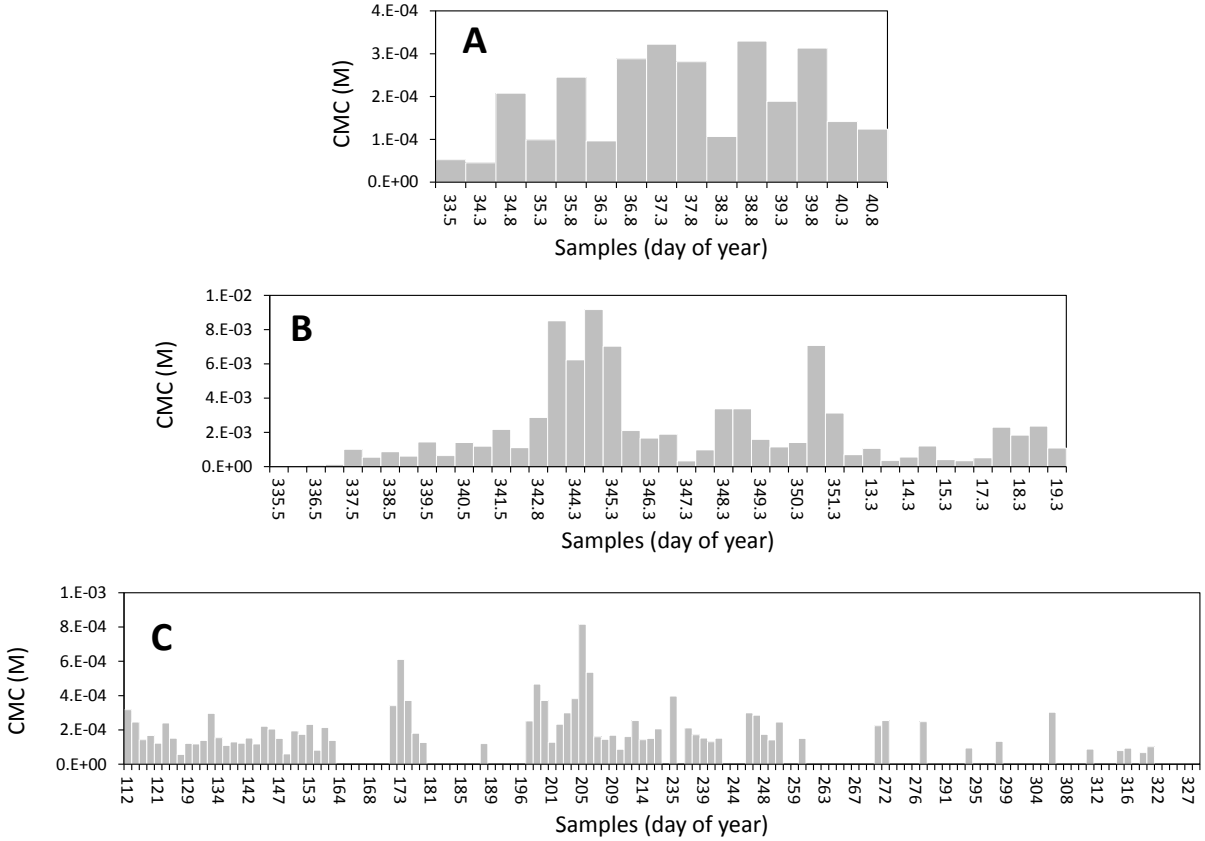
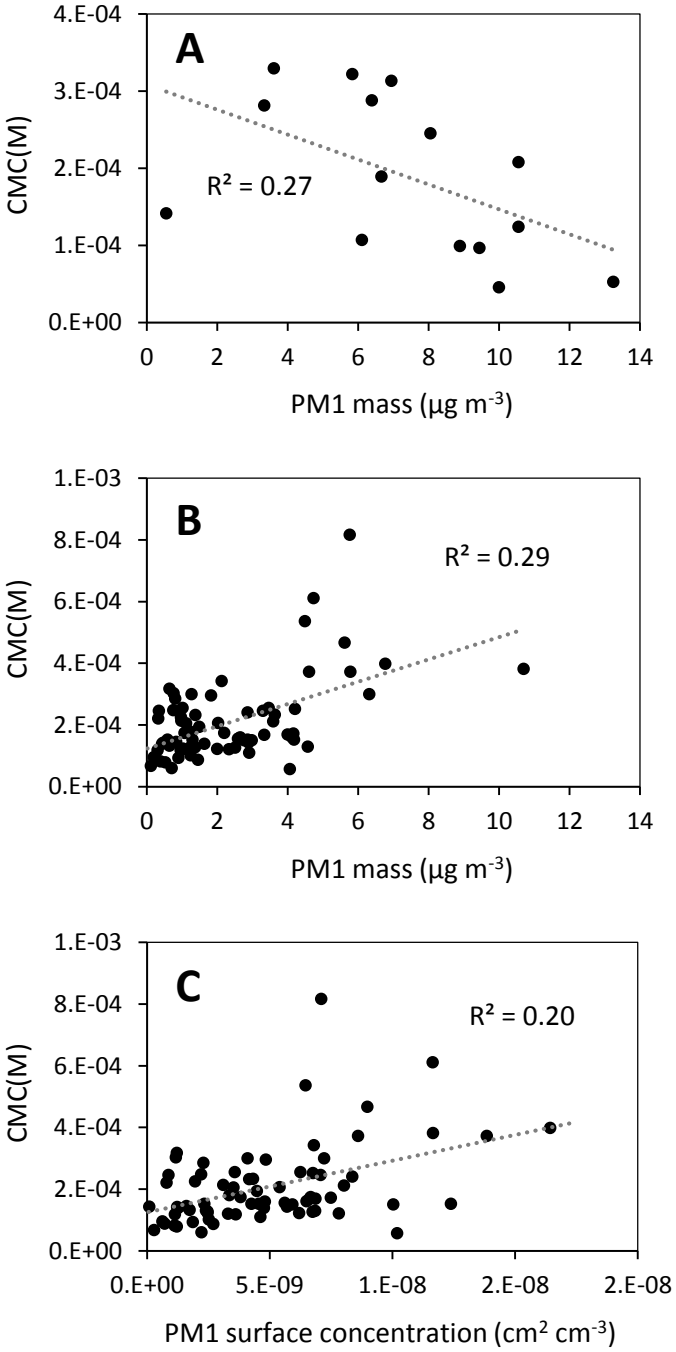
Figure S7: Correlations between the CMC and the PM_1 mass and surface concentrations: A) Rogoznica, Croatia (15 samples); B) and C) Pallas, Finland (75 samples).