

1 **Organic molecular composition of marine aerosols over the**  
2 **Arctic Ocean in summer: contributions of primary emission**  
3 **and secondary aerosol formation**

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16 **Table S1.** Concentrations ( $\text{ng m}^{-3}$ ) of the identified organic compounds in the marine samples  
 17 collected over the Arctic Ocean in summer 2009.

Compound	Concentration			
	min	max	mean	std <sup>a</sup>
<b>I. <i>n</i>-Alkanes</b>				
C <sub>18</sub>	0.001	0.083	0.018	0.025
C <sub>19</sub>	0.003	0.058	0.017	0.016
C <sub>20</sub>	0.002	0.058	0.014	0.016
C <sub>21</sub>	0.004	0.18	0.047	0.055
C <sub>22</sub>	0.003	0.16	0.031	0.048
C <sub>23</sub>	0.005	0.25	0.049	0.075
C <sub>24</sub>	0.004	0.37	0.054	0.11
C <sub>25</sub>	0.007	0.50	0.094	0.15
C <sub>26</sub>	0.004	0.43	0.062	0.13
C <sub>27</sub>	0.011	0.52	0.12	0.17
C <sub>28</sub>	0.003	0.18	0.035	0.055
C <sub>29</sub>	0.009	0.35	0.065	0.10
C <sub>30</sub>	0.005	0.23	0.038	0.068
C <sub>31</sub>	0.007	0.41	0.073	0.12
C <sub>32</sub>	0.006	0.39	0.052	0.12
C <sub>33</sub>	0.006	0.34	0.048	0.10
C <sub>34</sub>	0.000	0.006	0.001	0.002
subtotal	0.14	4.5	0.82	1.3
CPI (C <sub>21</sub> -C <sub>34</sub> ) <sup>b</sup>	1.5	7.0	2.3	1.6
<b>II. Fatty acids</b>				
C <sub>8:0</sub>	0.016	0.31	0.094	0.087
C <sub>9:0</sub>	0.012	0.38	0.13	0.13
C <sub>10:0</sub>	0.005	0.08	0.030	0.020
C <sub>11:0</sub>	0.004	0.09	0.029	0.028
C <sub>12:0</sub>	0.021	0.80	0.19	0.25
C <sub>13:0</sub>	0.007	0.18	0.039	0.056
C <sub>14:0</sub>	0.047	0.71	0.21	0.20
C <sub>15:0</sub>	0.017	0.25	0.086	0.081
C <sub>16:0</sub>	0.26	4.0	1.1	1.2
C <sub>17:0</sub>	0.010	0.18	0.044	0.050
C <sub>18:0</sub>	0.096	1.3	0.37	0.38
C <sub>19:0</sub>	0.003	0.05	0.018	0.016
C <sub>20:0</sub>	0.010	0.26	0.091	0.090
C <sub>21:0</sub>	0.003	0.07	0.023	0.023
C <sub>22:0</sub>	0.008	0.51	0.13	0.16
C <sub>23:0</sub>	0.001	0.052	0.009	0.016
C <sub>24:0</sub>	0.012	0.42	0.13	0.15
C <sub>25:0</sub>	0.004	0.11	0.027	0.034
C <sub>26:0</sub>	0.006	0.34	0.084	0.11
C <sub>27:0</sub>	0.005	0.14	0.024	0.043
C <sub>28:0</sub>	0.004	0.29	0.060	0.093
C <sub>29:0</sub>	nd <sup>c</sup>	0.01	0.001	0.002
C <sub>30:0</sub>	nd	0.03	0.003	0.009
C <sub>31:0</sub>	nd	0.01	0.001	0.004
C <sub>32:0</sub>	nd	0.001	0.000	0.001
C <sub>16:1</sub>	0.008	0.30	0.061	0.087
C <sub>18:1</sub>	0.025	2.5	0.57	0.92
C <sub>18:2</sub>	0.005	0.35	0.064	0.11
subtotal	0.90	11.9	3.6	4.0
C <sub>18:n</sub> /C <sub>18:0</sub>	0.15	3.9	1.2	1.1
CPI (C <sub>20:0</sub> -C <sub>32:0</sub> ) <sup>b</sup>	1.9	8.0	4.4	1.9

<b>III. Fatty alcohols</b>				
C <sub>12</sub>	0.005	1.1	0.20	0.32
C <sub>13</sub>	0.008	0.40	0.093	0.11
C <sub>14</sub>	0.057	1.6	0.55	0.59
C <sub>15</sub>	0.009	0.40	0.091	0.12
C <sub>16</sub>	0.039	1.5	0.35	0.46
C <sub>17</sub>	0.005	0.18	0.032	0.053
C <sub>18</sub>	0.019	0.42	0.11	0.14
C <sub>19</sub>	0.003	0.04	0.014	0.013
C <sub>20</sub>	0.007	0.18	0.051	0.052
C <sub>21</sub>	0.002	0.11	0.023	0.030
C <sub>22</sub>	0.014	0.55	0.12	0.16
C <sub>23</sub>	0.005	0.26	0.049	0.077
C <sub>24</sub>	0.008	0.58	0.13	0.19
C <sub>25</sub>	0.007	0.25	0.043	0.075
C <sub>26</sub>	0.020	0.84	0.21	0.28
C <sub>27</sub>	0.005	0.15	0.040	0.045
C <sub>28</sub>	0.033	1.3	0.43	0.51
C <sub>29</sub>	nd	0.001	0.001	0.001
C <sub>30</sub>	0.003	0.17	0.035	0.048
Subtotal	0.42	8.13	2.6	2.8
CPI (C <sub>20</sub> -C <sub>30</sub> ) <sup>b</sup>	2.8	17.8	6.9	4.7
<b>IV. Sugar compounds</b>				
<i>Anhydrosugars</i>				
galactosan	nd	0.15	0.043	0.052
mannosan	0.004	0.38	0.11	0.12
levoglucosan	0.010	0.93	0.37	0.36
<i>Sugars</i>				
fructose	0.039	2.3	0.51	0.72
glucose	0.18	26.5	6.4	8.6
sucrose	0.008	7.4	1.3	2.4
maltose	nd	0.37	0.049	0.11
trehalose	0.010	8.7	1.4	2.7
<i>Sugar alcohols</i>				
glycerol	0.22	3.3	1.1	1.1
erythritol	0.005	0.68	0.099	0.21
arabitol	0.10	24.1	4.5	8.7
mannitol	0.052	53.3	9.2	16.2
inositol	0.008	0.42	0.11	0.14
subtotal	2.1	112	25.0	37.6
sum of anhydrosugars	0.022	1.2	0.52	0.50
sum of sugars/sugar alcohols	0.91	111	24.5	37.5
<b>V. Lignin and resin acids</b>				
vanillic acid	0.004	0.09	0.020	0.028
dehydroabietic acid	0.022	0.65	0.14	0.18
subtotal	0.026	0.75	0.16	0.21
<b>VI. Sterols</b>				
cholesterol	0.035	0.96	0.21	0.27
ergosterol	0.030	1.9	0.33	0.58
β-sitosterol	0.017	0.69	0.15	0.21
subtotal	0.128	3.2	0.69	0.98
<b>VII. Phthalate esters</b>				
dimethyl phthalate (DMP)	0.004	0.13	0.025	0.039
diethyl phthalate (DEP)	0.028	0.42	0.16	0.12
diisobutyl phthalate (DiBP)	0.097	1.0	0.21	0.28
di-n-butyl phthalate (DnBP)	0.13	2.0	0.48	0.54
di-(2-ethylhexyl) phthalate (DEHP)	0.46	8.9	1.7	2.6

subtotal	0.79	12.4	2.6	3.5
<b>VIII. Hydroxy/polyacids</b>				
glycolic	0.12	1.5	0.65	0.54
lactic	0.11	2.5	0.75	0.84
glyceric	0.053	2.0	0.48	0.67
malic	0.076	4.7	0.95	1.5
tricarballic	0.001	0.30	0.044	0.095
subtotal	0.36	8.7	2.9	2.9
<b>IX. Aromatic acids</b>				
phthalic	0.019	0.92	0.16	0.27
<i>iso</i> -phthalic (i-ph)	0.002	0.14	0.028	0.041
<i>tere</i> -phthalic (t-ph)	0.002	0.16	0.035	0.053
2-hydroxybenzoic (salicylic)	0.003	0.03	0.009	0.008
3-hydroxybenzoic	0.002	0.06	0.013	0.018
4-hydroxybenzoic	0.021	0.36	0.095	0.12
3,4-dihydroxybenzoic	0.004	0.13	0.025	0.039
subtotal	0.056	1.8	0.37	0.51
<b>X. Biogenic SOA tracers</b>				
2-methylglyceric acid (2-MGA)	0.064	1.8	0.41	0.67
C <sub>5</sub> -alkene triols <sup>d</sup>	0.005	1.9	0.39	0.72
2-methylthreitol	0.034	9.4	1.1	2.9
2-methylerythritol	0.026	19.0	2.1	5.9
3-hydroxyglutaric acid (3-HGA)	0.002	0.22	0.049	0.071
<i>cis</i> -pinonic acid	0.040	2.6	0.46	0.85
HDCCA <sup>e</sup>	0.10	4.9	1.1	1.9
3-acetylglutaric acid	0.036	5.8	1.2	2.3
3-acetyl adipic acid	0.017	7.4	1.5	2.9
3-isopropylglutaric acid	0.006	2.6	0.40	0.81
pinic acid	0.005	0.52	0.11	0.15
MBTCA <sup>f</sup>	nd	0.04	0.007	0.012
β-caryophyllinic acid	0.005	0.048	0.017	0.015
Σisoprene SOA tracers	0.16	31.7	4.0	9.9
Σmonoterpene SOA tracers	0.44	24.1	4.8	8.9
subtotal	0.63	55.8	8.8	18.0
total organics (ng m <sup>-3</sup> )	7.3	185	47.6	67.6
OC, (μgC m <sup>-3</sup> )	0.11	2.9	0.56	0.84
total organics in OC (%) <sup>g</sup>	1.8	11.0	4.1	2.8

18 <sup>a</sup> std: standard deviation.

19 <sup>b</sup> CPI, carbon preference index:

20  $(C_{21}+C_{23}+C_{25}+C_{27}+C_{29}+C_{31}+C_{33})/(C_{22}+C_{24}+C_{26}+C_{28}+C_{30}+C_{32}+C_{34})$  for *n*-alkanes;

21  $(C_{20}+C_{22}+C_{24}+C_{26}+C_{28}+C_{30}+C_{32})/(C_{21}+C_{23}+C_{25}+C_{27}+C_{29}+C_{31})$  for fatty acids and *n*-  
22 alcohols.

23 <sup>c</sup> nd: not detected.

24 <sup>d</sup> C<sub>5</sub>-alkene triols: the sum of *cis*-2-methyl-1,3,4-trihydroxy-1-butene, *trans*-2-methyl-1,3,4-  
25 trihydroxy-1-butene, and 3-methyl-2,3,4-trihydroxy-1-butene.

26 <sup>e</sup> HDCCA: 3-(2-hydroxyethyl)-2,2-dimethyl-cyclobutane carboxylic acid.

27 <sup>f</sup> MBTCA: 3-methyl-1,2,3-butanetricarboxylic acid.

28 <sup>g</sup> All the quantified organic compounds were converted to their carbon contents to calculate  
29 the OC ratios.