Supplement Information

One-year characterization of organic aerosol composition and sources using an extractive electrospray ionization time-of-flight mass spectrometer (EESI-TOF)

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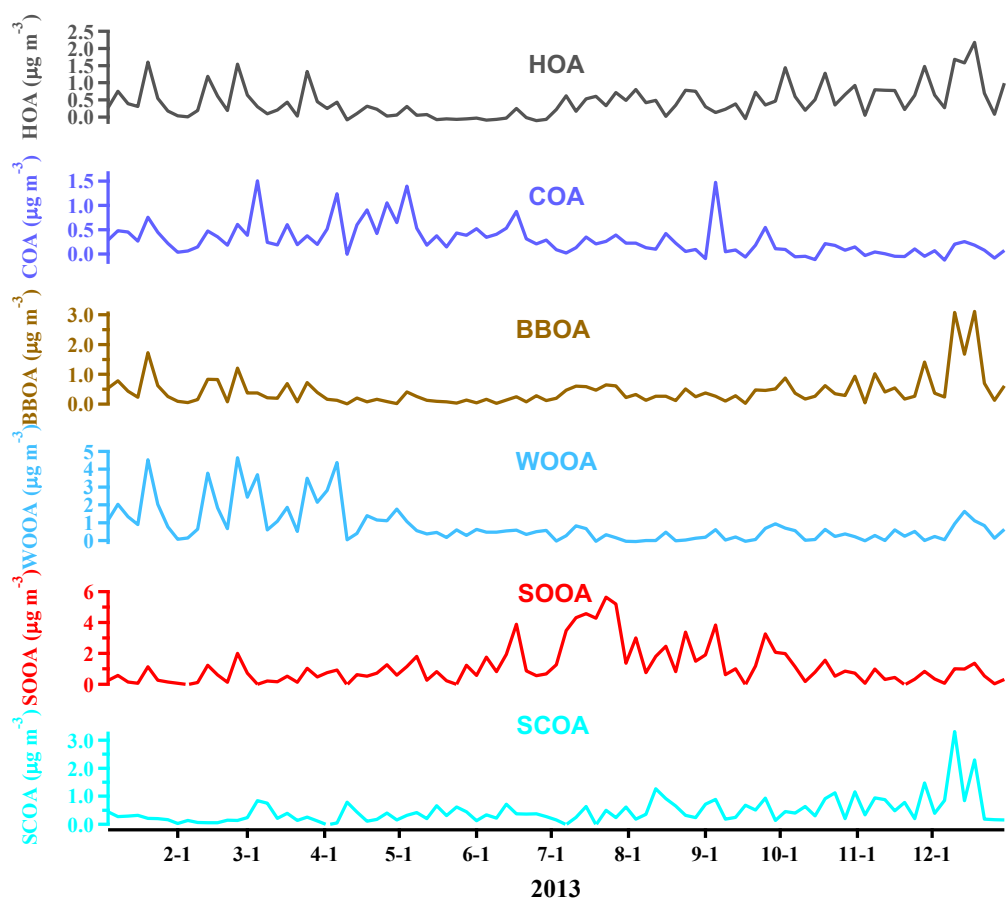


Fig. S1. Time series of AMS source apportionment factors.

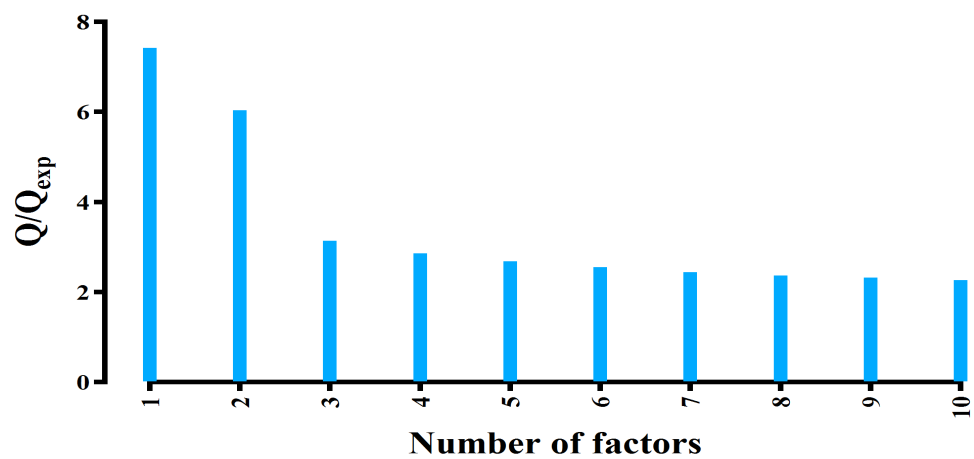
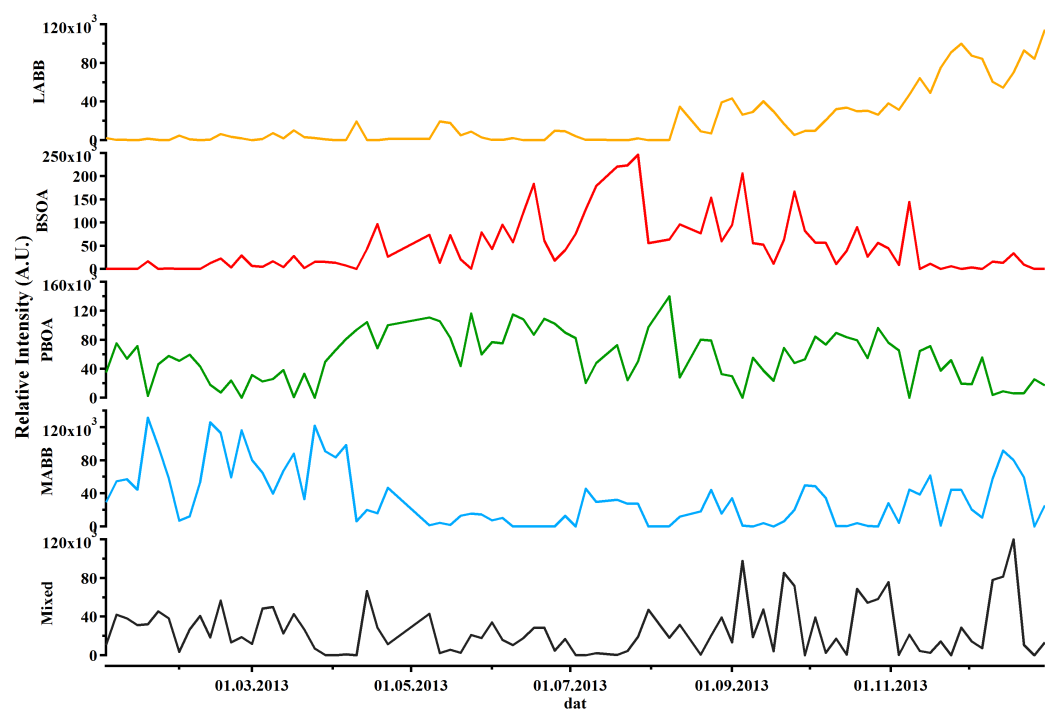



Fig. S2. *Q/Q$_{exp}$* for the solutions consisting of 1 to 10 factors.

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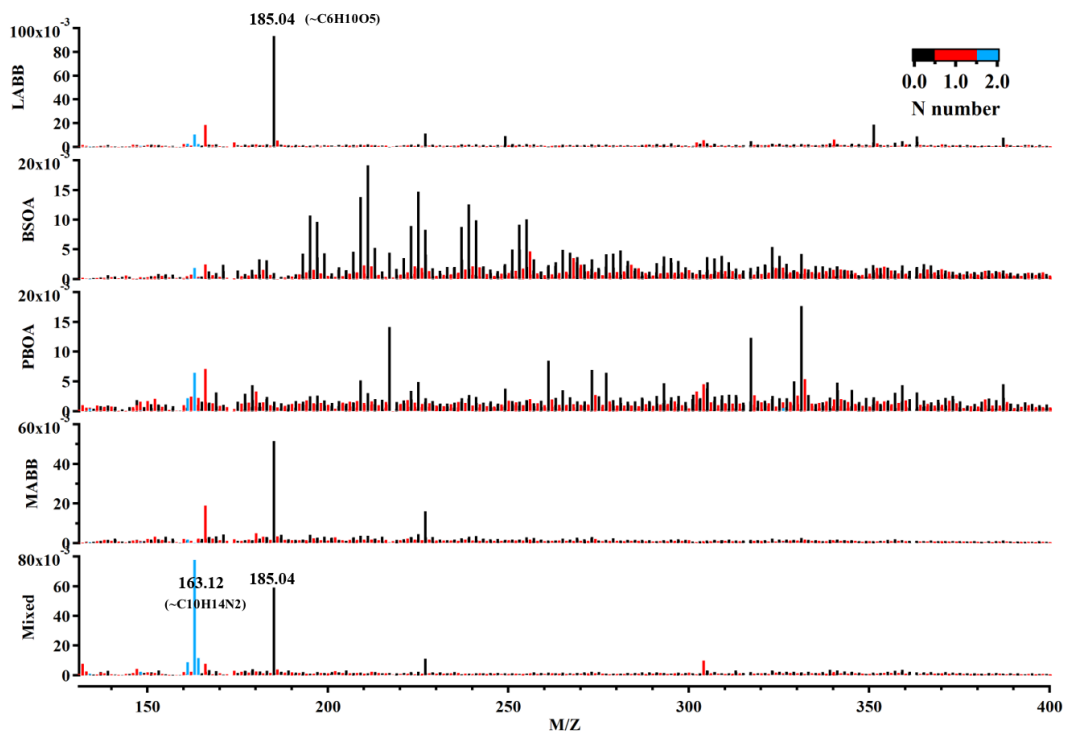
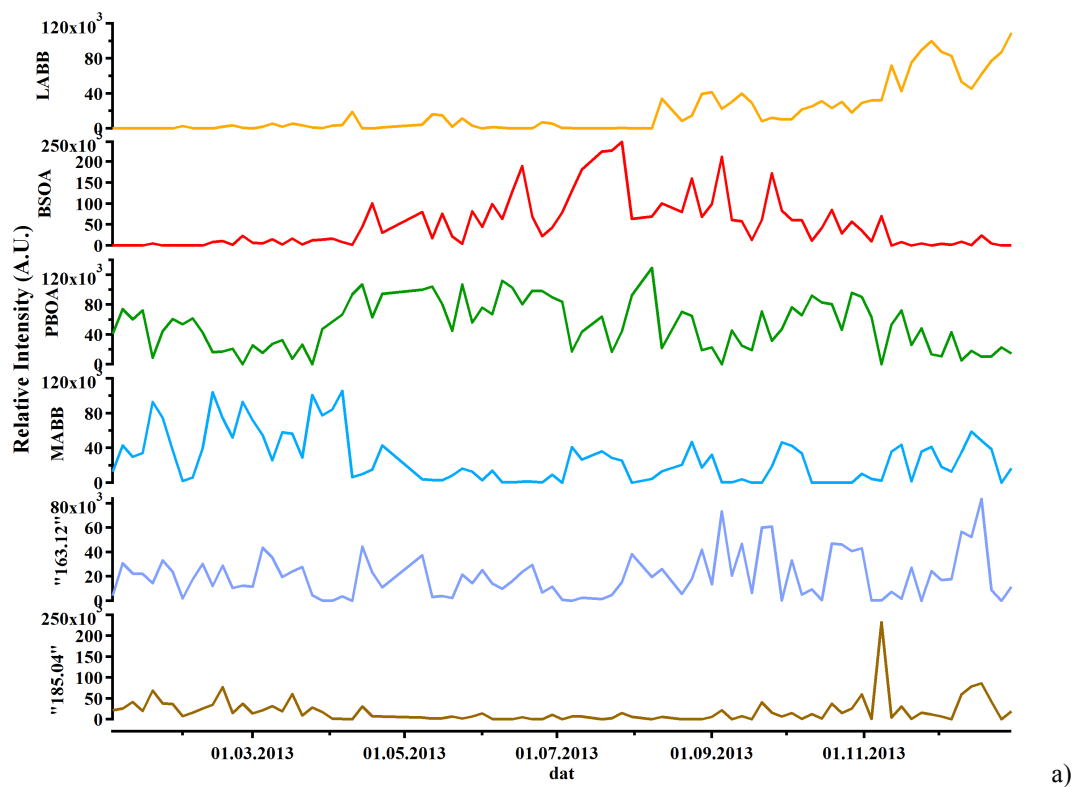

b)

Fig. S3. Time series (a) and profiles (b) of the EESI-TOF 5-factor PMF solution.

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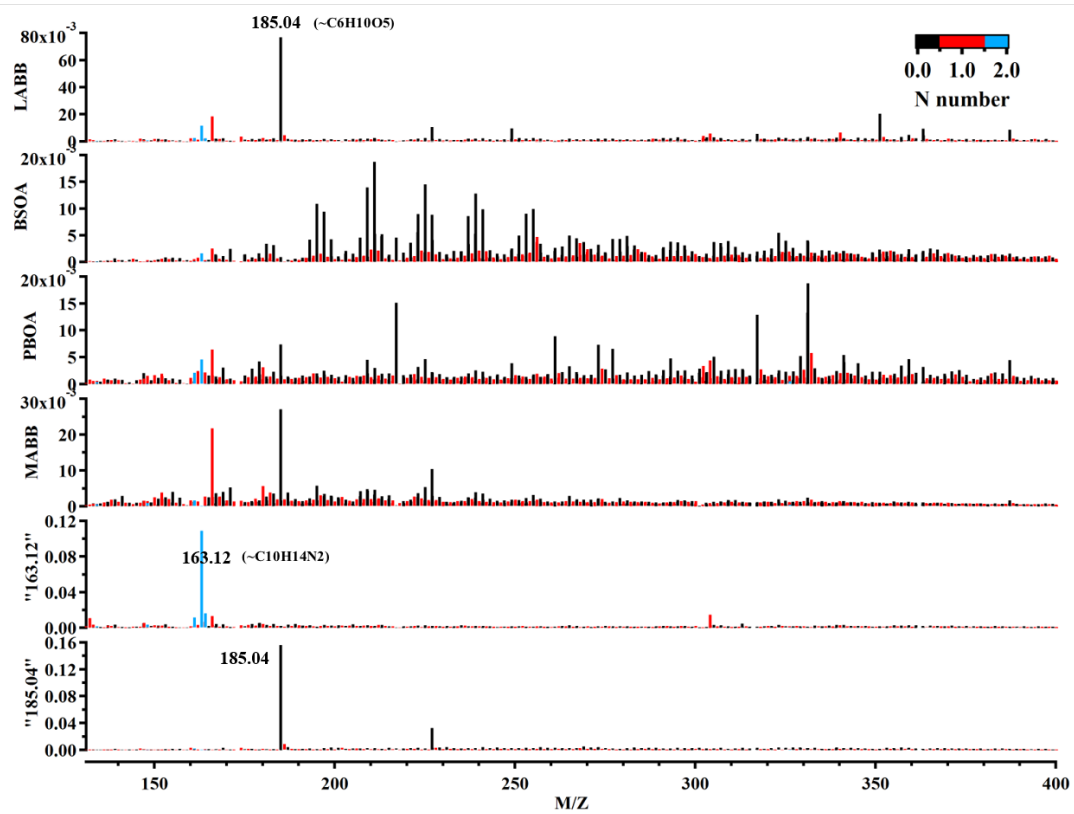
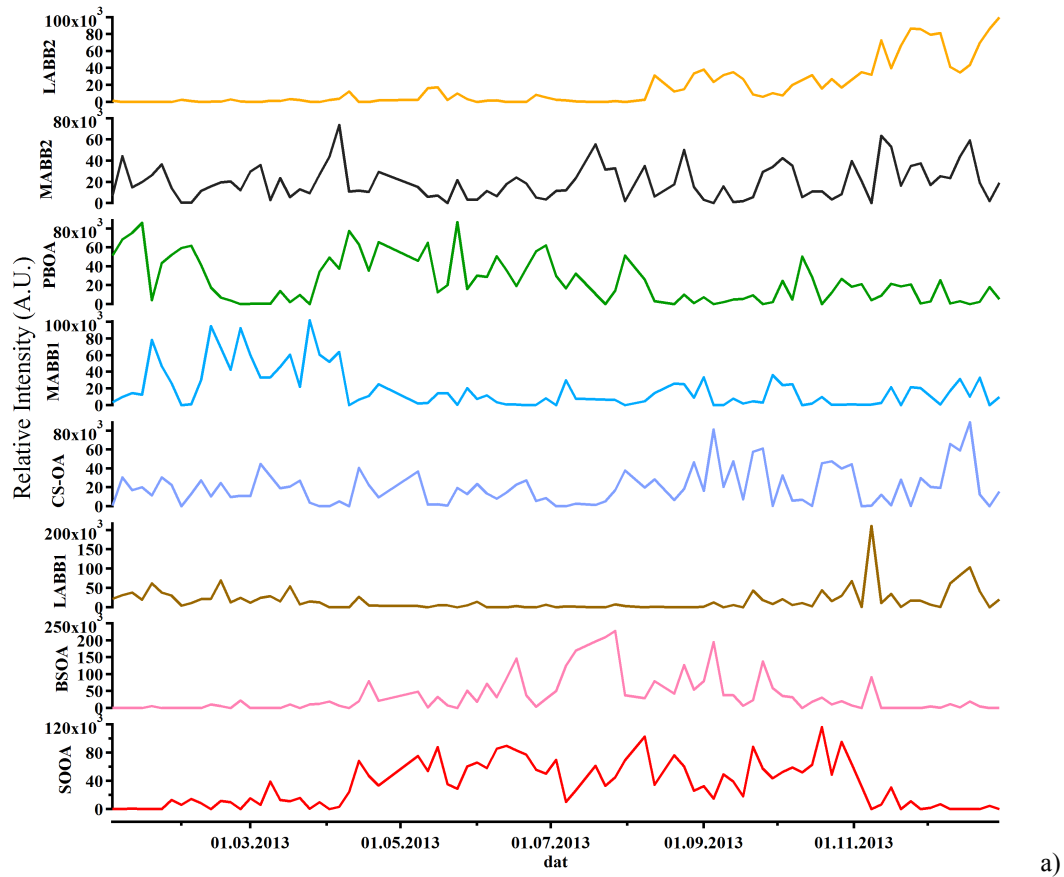

b)

Fig. S4. Time series (a) and profiles (b) of the EESI-TOF 6-factor PMF solution.

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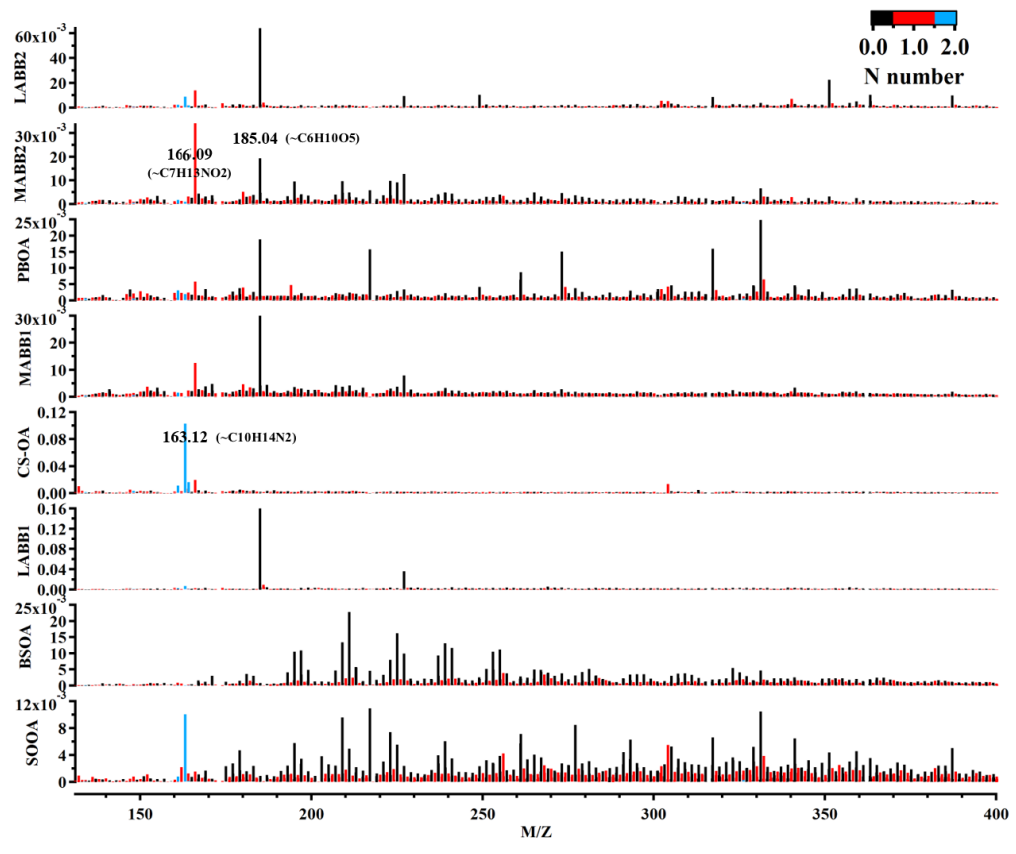

b)

Fig. S5. Time series (a) and profiles (b) of EESI-TOF eight-factors solution.

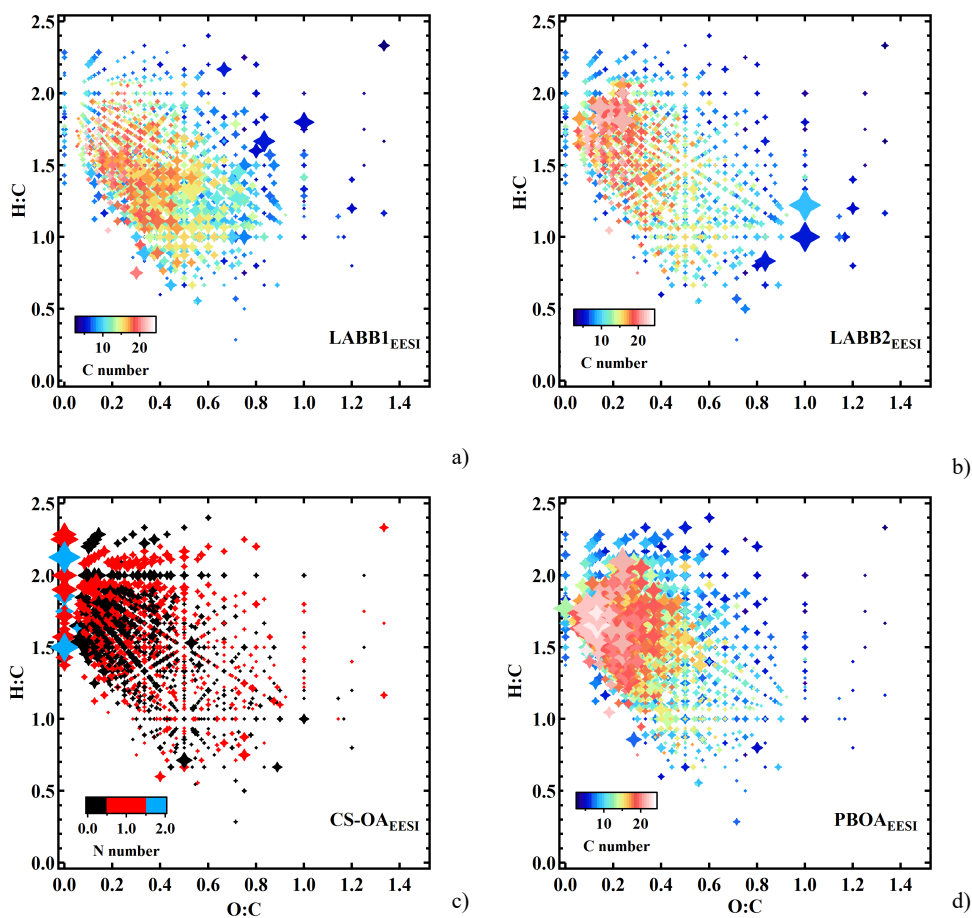



Fig. S6. Van Krevelen plots (atomic H:C vs. O:C ratio) of the LABB1$_{EESI}$, LABB2$_{EESI}$, CS-OA$_{EESI}$ and PBOA$_{EESI}$ factor mass spectra. Points are sized by the fraction of each ion apportioned to LABB1$_{EESI}$, LABB2$_{EESI}$, CS-OA$_{EESI}$ and PBOA$_{EESI}$, colored by number of carbon atoms and nitrogen number, respectively.

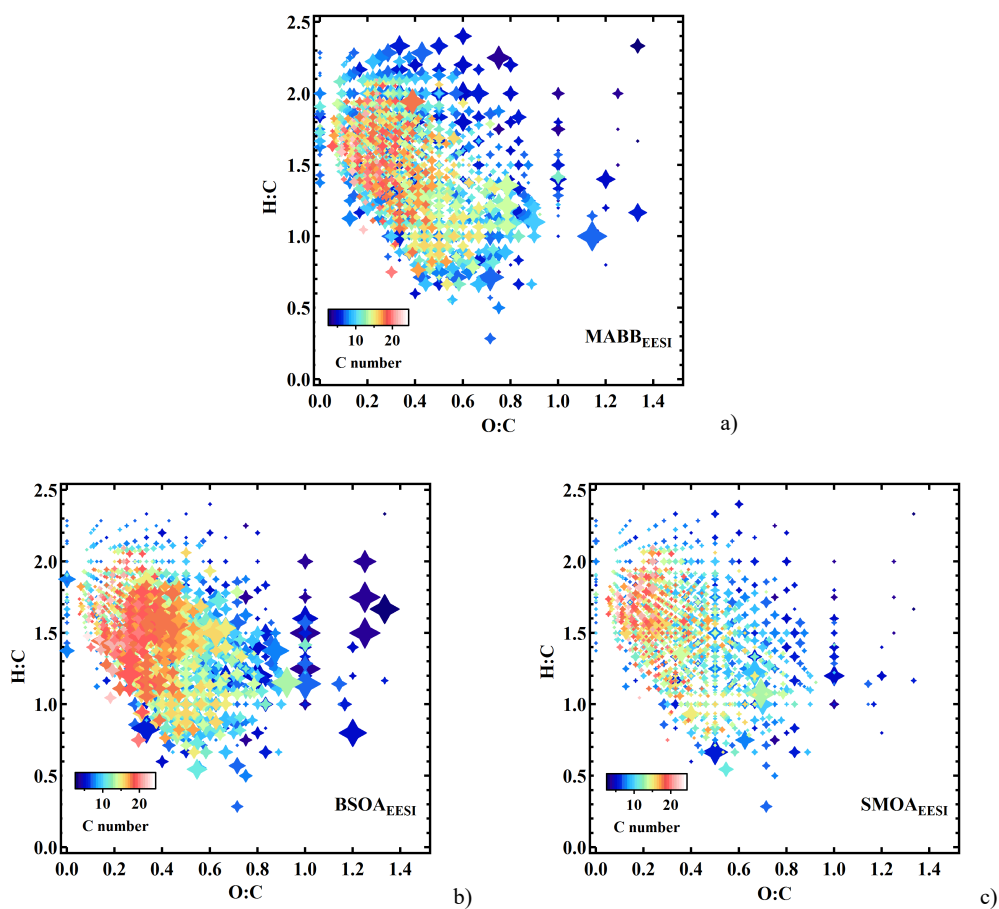



Fig. S7. Van Krevelen plot (atomic H:C vs. O:C ratio) of the MABB1$_{EESI}$, SMOA$_{EESI}$ and BSOA$_{EESI}$ factor mass spectra. Points are sized by the fraction of each ion apportioned to each factor and colored by number of carbon atoms and nitrogen number.

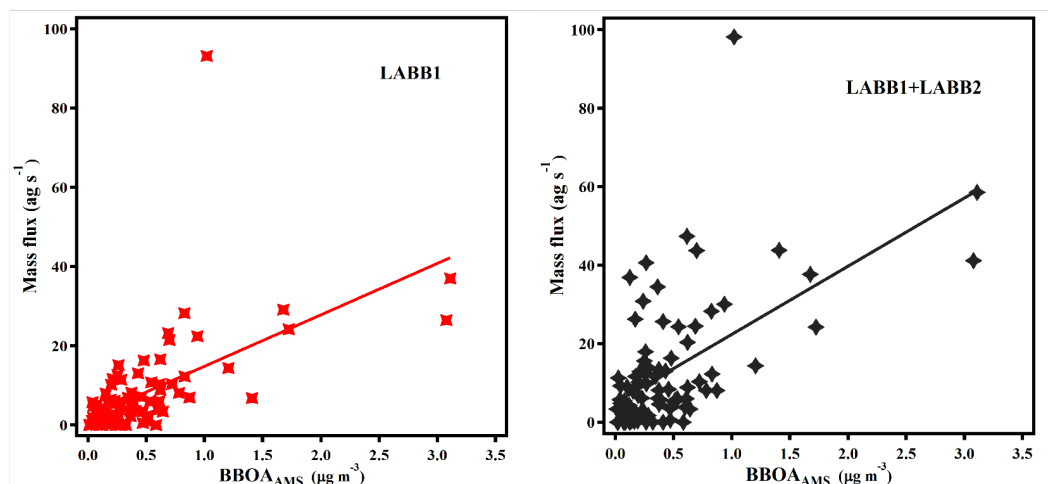



Fig. S8. Scatter plot of the LABB1$_{EESI}$ factor and LABB1$_{EESI}$+LABB2$_{EESI}$ factor as a function of the

BBOA_AMS factor.

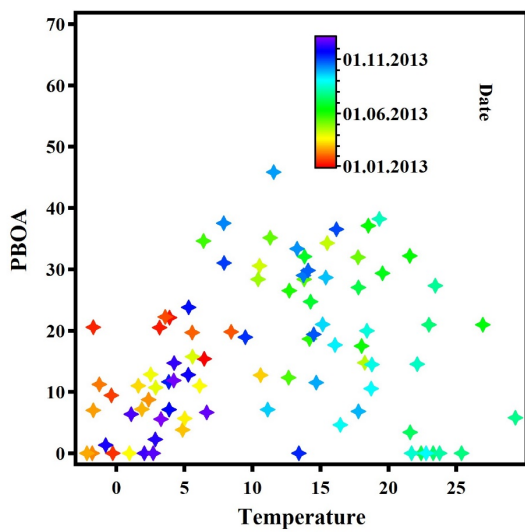
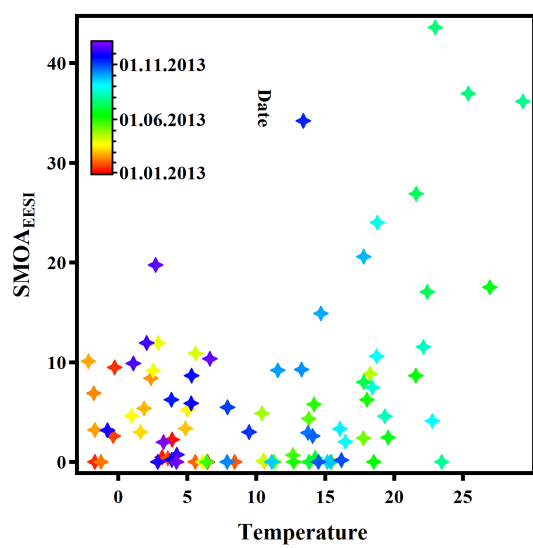



Fig. S9. The scatter plot of the temperature as a function of the PBOA factor of the EESI-TOF PMF.

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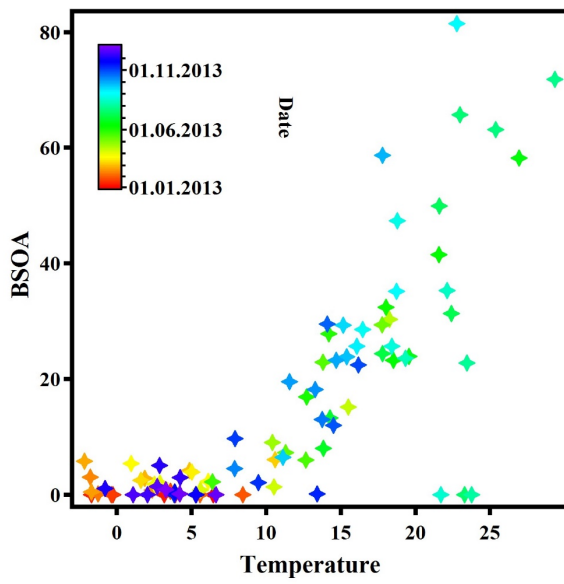
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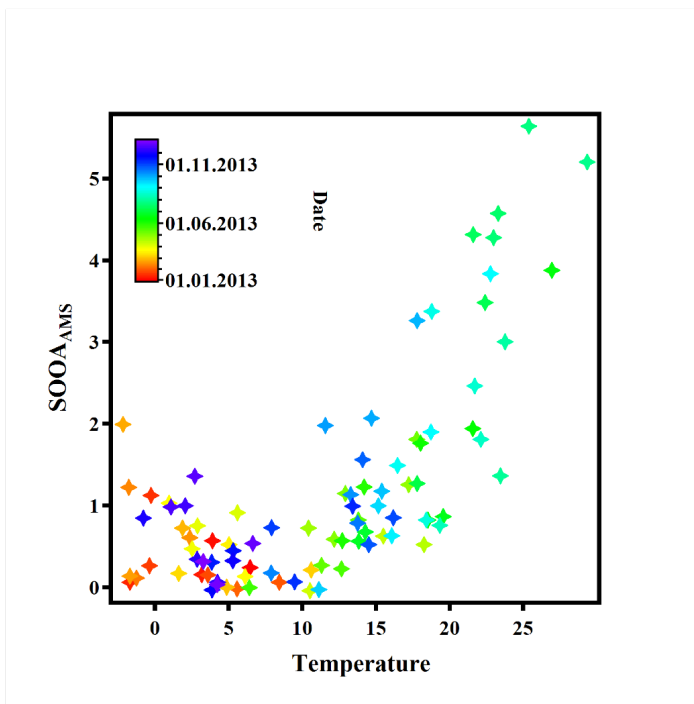
c)

Fig. S10. The scatter plot of the temperature as a function of the SMOA$_{EESI}$ factor (a), BSOA$_{EESI}$ factor (b) and SOOA$_{AMS}$ factor of the EESI-TOF PMF.
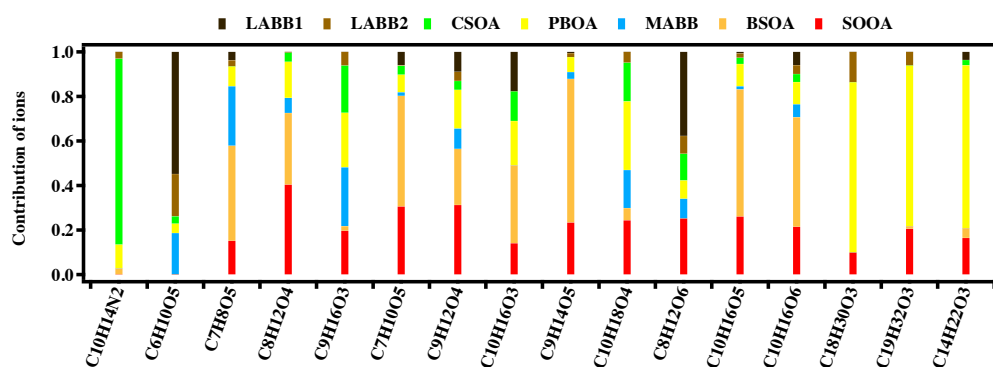
Fig. S11. Contribution of each ions to each factor from EESI-TOF PMF analysis.

Fig. S12. Correlation between all the AMS and EESI factors.

Table S1. The list of the distinguished molecules of each factor.

Factor name	Formula	m/z			
				C6H10O5	162.053
				C7H11NO6	205.059
LABB1	C5H8O4	132.042		C8H12O6	204.063
	C5H9NO5	163.048		C8H15NO5	205.095

C8H7NO3	165.043
C9H11NO3	181.074
C9H13NO3	183.09
C9H8O3	164.047
C10H11NO4	209.069
C10H11NO5	225.064
C10H11NO6	241.059
C10H12O4	196.074
C10H12O6	228.063
C10H12O7	244.058
C10H13NO5	227.079
C10H14O7	246.074
C11H12O4	208.074
C11H12O5	224.069
C11H13NO4	223.085
C11H13NO5	239.079
C11H13NO6	255.074
C11H13NO7	271.069
C11H14O4	210.089
C11H14O6	242.079
C11H14O7	258.074
C11H14O8	274.069
C11H15NO4	225.1
C11H16O7	260.09
C11H16O8	276.085
C12H14O3	206.094
C12H14O4	222.089
C12H14O7	270.074
C12H15NO4	237.1
C12H15NO5	253.095
C12H15NO6	269.09
C12H16O4	224.105

C12H16O7	272.09
C12H16O8	288.085
C13H14O5	250.084
C13H14O6	266.079
C13H16O4	236.105
C13H16O5	252.1
C13H16O6	268.095
C13H17NO4	251.116
C14H14O5	262.084
C14H16O5	264.1
C14H17NO6	295.106
C14H18O5	266.115
C14H18O7	298.105
C14H20O8	316.116
C15H16O6	292.095
C15H16O8	324.085
C15H18O5	278.115
C15H18O6	294.11
C15H20O6	296.126
C15H20O8	328.116
C15H22O8	330.132
C16H18O5	290.115
C16H20O5	292.131
C16H20O6	308.126
C16H22O10	374.121
C16H22O5	294.147
C16H22O6	310.142
C16H22O7	326.137
C16H23NO5	309.158
C16H24O9	360.142
C17H20O5	304.131
C17H22O5	306.147

	C17H22O6	322.142		C17H33NO2	283.251
	C17H24O8	356.147		C17H35NO4	317.257
	C17H24O9	372.142		C18H31NO5	341.22
	C18H20O7	348.121		C18H32O3	296.235
	C18H22O6	334.142		C18H32O5	328.225
	C18H22O8	366.132		C18H33NO3	311.246
	C18H24O5	320.162		C18H33NO4	327.241
	C18H24O7	352.152		C18H34O3	298.251
	C18H24O8	368.147		C18H34O5	330.241
	C19H18O6	342.11		C19H32O5	340.225
	C19H22O6	346.142		C19H33NO5	355.236
	C19H22O7	362.137		C19H33NO6	371.231
	C19H26O6	350.173		C19H34O4	326.246
	C20H24O5	344.162		C19H36O3	312.267
LABB2	C5H6O6	162.016		C19H36O4	328.262
	C6H5NO5	171.017		C20H29NO4	347.21
	C6H6O6	174.016		C20H35NO3	337.262
	C6H6O7	190.011		C20H38O5	358.272
	C7H4O5	168.006		C21H38O3	338.282
	C8H4O6	196.001		C21H38O5	370.272
	C13H22O3	226.157		C21H40O3	340.298
	C13H24O3	228.173		C21H40O4	356.293
	C15H28O4	272.199		C21H42O5	374.303
	C16H25NO3	279.184		C22H37NO2	347.283
	C16H28O3	268.204		C22H38O2	334.287
	C16H29NO5	315.205		C22H40O3	352.298
	C17H28O3	280.204		C24H31NO2	365.236
	C17H29NO2	279.22	CS-OA	C6H11N2	111.092
	C17H30O5	314.209		C6H13NO	115.1
	C17H31NO	265.241		C6H13NO3	147.09
	C17H31NO2	281.236		C6H9NO	111.068
	C17H31NO5	329.22		C7H10N	108.081

C7H10O	110.073		C8H17NO3	175.121
C7H11N	109.089		C8H17NO4	191.116
C7H11NO	125.084		C8H18N	128.144
C7H12N	110.097		C8H18O	130.136
C7H12O	112.089		C8H18O3	162.126
C7H13N2	125.108		C9H15N	137.121
C7H13NO	127.1		C9H15NO	153.115
C7H14O	114.105		C9H17NO	155.131
C7H14O3	146.094		C9H18O3	174.126
C7H15N	113.121		C9H18O4	190.121
C7H15NO	129.115		C9H19NO	157.147
C7H15NO2	145.11		C9H19NO3	189.137
C7H15NO3	161.105		C9H20O	144.152
C7H15NO4	177.1		C9H20O2	160.146
C7H16N	114.128		C9H20O3	176.141
C7H16O	116.12		C10H14O3	182.094
C8H10O	122.073		C10H15N2	163.124
C8H12O	124.089		C10H15NO	165.115
C8H13N	123.105		C10H17NO	167.131
C8H14N	124.113		C10H18O	154.136
C8H14N2	138.116		C10H19N	153.152
C8H14O	126.105		C10H19NO	169.147
C8H14O2	142.099		C10H19NO2	185.142
C8H15NO	141.115		C10H20O	156.152
C8H15NO2	157.11		C10H21NO	171.162
C8H16	112.125		C10H21NO3	203.152
C8H16N	126.128		C10H21NO4	219.147
C8H16O	128.12		C10H22O	158.167
C8H16O2	144.115		C11H16O	164.12
C8H16O3	160.11		C11H18O	166.136
C8H17N2	141.139		C11H18O2	182.131
C8H17NO	143.131		C11H18O3	198.126

	C11H19N	165.152		C14H21NO2	235.157
	C11H19NO	181.147		C14H22O	206.167
	C11H20O	168.152		C14H22O2	222.162
	C11H20O3	200.141		C14H23NO2	237.173
	C11H21N	167.168		C14H24O3	240.173
	C11H21NO	183.162		C14H24O3	240.173
	C11H21NO2	199.157		C14H25NO2	239.189
	C11H22O	170.167		C14H27NO2	241.204
	C11H23NO3	217.168		C14H29NO3	259.215
	C11H23NO4	233.163		C15H22O2	234.162
	C12H18O	178.136		C15H23NO4	281.163
	C12H19NO2	209.142		C15H24O2	236.178
	C12H20O2	196.146		C15H26O3	254.188
	C12H20O3	212.141		C15H27NO	237.209
	C12H21NO2	211.157		C15H27NO2	253.204
	C12H22O	182.167		C15H27NO3	269.199
	C12H23NO	197.178		C15H27NO6	317.184
	C12H23NO2	213.173		C15H28O3	256.204
	C12H25NO	199.194		C15H29NO2	255.22
	C12H25NO4	247.178		C15H29NO3	271.215
	C13H20O	192.152		C15H30O3	258.22
	C13H20O2	208.146		C16H27NO3	281.199
	C13H21NO	207.162		C16H31NO3	285.231
	C13H21NO2	223.157		C17H28O2	264.209
	C13H22O2	210.162		C17H30O3	282.22
	C13H23NO	209.178		C18H32O4	312.23
	C13H23NO2	225.173	PBOA	C9H16O2	156.115
	C13H24O	196.183		C9H17NO2	171.126
	C13H25NO	211.194		C12H18O2	194.131
	C13H26O3	230.188		C12H19NO	193.147
	C13H26O4	246.183		C12H22O5	246.147
	C13H27NO3	245.199		C13H18O4	238.121

	C13H21NO3	239.152		C18H30O2	278.225
	C13H21NO4	255.147		C18H30O3	294.22
	C13H23N	193.183		C18H30O4	310.215
	C14H21NO3	251.152		C18H32O7	360.215
	C14H22O3	238.157		C19H24O5	332.162
	C14H22O4	254.152		C19H28O3	304.204
	C14H23NO3	253.168		C19H28O4	320.199
	C14H24O6	288.157		C19H30O3	306.22
	C14H26O5	274.178		C19H30O4	322.215
	C14H29NO4	275.21		C19H31NO2	305.236
	C15H20O4	264.136		C19H32O3	308.235
	C15H22O4	266.152		C19H33NO2	307.251
	C15H23NO2	249.173		C19H34O6	358.236
	C15H23NO3	265.168		C19H34O7	374.231
	C15H25NO	235.194		C20H26O5	346.178
	C15H26O	222.198		C20H30O5	350.209
	C15H26O4	270.183		C20H31NO4	349.225
	C16H22O3	262.157		C20H33NO3	335.246
	C16H24O3	264.173		C20H34O6	370.236
	C16H26O4	282.183		C20H35NO2	321.267
	C16H27NO	249.209		C21H30O5	362.209
	C16H30O3	270.22		C21H34O2	318.256
	C16H30O3	270.22		C21H34O4	350.246
	C17H22O4	290.152		C21H44O5	376.319
	C17H25NO3	291.184		C22H34O3	346.251
	C17H25NO4	307.178		C22H36O2	332.272
	C17H27NO4	309.194		C22H37NO3	363.278
	C18H24O4	304.168		C22H39NO2	349.298
	C18H26O4	306.183		C23H38O3	362.282
	C18H27NO5	337.189	MABB	C4H7NO4	133.038
	C18H28O4	308.199		C4H9NO3	119.058
	C18H29NO2	291.22		C5H10O3	118.063

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C7H7NO5	185.032
C7H7NO8	233.017
C7H8O6	188.032
C7H9NO2	139.063
C7H9NO3	155.058
C8H10O2	138.068
C8H13NO2	155.095
C8H15NO3	173.105
C8H15NO6	221.09
C8H18O2	146.131
C8H6O4	166.027
C8H7NO6	213.027
C8H8O4	168.042
C8H9NO	135.068
C8H9NO7	231.038
C9H10O8	246.038
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C9H11NO8	261.048
C9H13NO2	167.095
C9H15NO2	169.11
C9H15NO3	185.105
C9H17NO5	219.111
C9H18O2	158.131
C9H19NO5	221.126
C9H6O6	210.016
C9H7NO4	193.038
C9H7NO5	209.032

	C9H8O7	228.027		C12H19NO4	241.131
	C9H9NO6	227.043		C12H19NO5	257.126
	C10H10O9	274.032		C12H21NO4	243.147
	C10H11NO3	193.074		C12H21NO5	259.142
	C10H11NO8	273.048		C12H21NO6	275.137
	C10H11NO9	289.043		C13H13NO7	295.069
	C10H12O2	164.084		C13H19NO3	237.137
	C10H12O9	276.048		C14H11NO9	337.043
	C10H14O2	166.099		C14H15NO10	357.07
	C10H15NO2	181.11		C14H17NO11	375.08
	C10H17NO2	183.126		C14H19NO10	361.101
	C10H17NO3	199.121		C14H19NO11	377.096
	C10H17NO4	215.116		C15H15NO10	369.07
	C10H19NO4	217.131		C15H21NO3	263.152
	C10H19NO5	233.126	BSOA	C3H5NO4	119.022
	C10H20O3	188.141		C4H5NO4	131.022
	C10H9NO6	239.043		C4H6O4	118.027
	C10H9NO7	255.038		C4H6O5	134.022
	C11H11NO7	269.054		C4H7NO5	149.032
	C11H13NO3	207.09		C5H6O3	114.032
	C11H13NO8	287.064		C5H6O4	130.027
	C11H14O2	178.099		C5H7NO4	145.038
	C11H16O2	180.115		C5H8O5	148.037
	C11H17NO3	211.121		C6H5NO2	123.032
	C11H17NO4	227.116		C6H7NO4	157.038
	C11H19NO4	229.131		C7H10O6	190.048
	C11H21NO5	247.142		C7H11NO5	189.064
	C11H9NO7	267.038		C7H11NO7	221.054
	C11H9NO8	283.033		C7H8O7	204.027
	C12H11NO6	265.059		C8H11NO7	233.054
	C12H17NO5	255.111		C8H12O5	188.069
	C12H19NO3	225.137		C8H9NO4	183.053

C9H12O6	216.063
C9H13NO5	215.079
C9H13NO6	231.074
C9H13NO7	247.069
C9H14O5	202.084
C9H8O5	196.037
C9H8O6	212.032
C10H10O5	210.053
C10H10O6	226.048
C10H14O6	230.079
C10H15NO7	261.085
C10H16O5	216.1
C10H16O6	232.095
C11H17NO5	243.111
C11H17NO6	259.106
C11H17NO7	275.101
C11H18O5	230.115
C11H19NO7	277.116
C11H9NO5	235.048
C12H11NO5	249.064
C12H17NO7	287.101
C12H18O5	242.115
C12H18O6	258.11
C12H19NO6	273.121
C12H19NO7	289.116
C12H20O5	244.131
C13H13NO5	263.079
C13H15NO5	265.095
C13H19NO6	285.121
C13H20O5	256.131
C13H20O7	288.121
C13H22O6	274.142

C14H20O6	284.126
C14H22O5	270.147
C14H22O6	286.142
C14H23NO4	269.163
C14H24O5	272.162
C14H25NO5	287.173
C15H21NO7	327.132
C15H22O6	298.142
C15H22O7	314.137
C15H23NO10	377.132
C15H23NO5	297.158
C15H23NO6	313.153
C15H23NO7	329.148
C15H23NO9	361.137
C15H24O5	284.162
C15H24O7	316.152
C15H25NO5	299.173
C15H25NO6	315.168
C15H25NO7	331.163
C15H26O5	286.178
C15H28O5	288.194
C16H15NO5	301.095
C16H17NO5	303.111
C16H19NO5	305.126
C16H24O10	376.137
C16H24O5	296.162
C16H24O6	312.157
C16H24O7	328.152
C16H26O5	298.178
C17H24O7	340.152
C17H25NO8	371.158
C17H26O5	310.178

	C17H27NO5	325.189
	C17H27NO6	341.184
	C17H27NO7	357.179
	C17H29NO5	327.205
	C18H20O4	300.136
	C18H23NO3	301.168
	C18H26O3	290.188
	C18H26O5	322.178
	C18H27NO7	369.179
	C18H28O5	324.194
	C18H28O7	356.184
	C18H28O8	372.179
	C18H29NO6	355.2
	C18H29NO7	371.195
	C18H30O5	326.209
	C19H21NO5	343.142
	C19H23NO5	345.158
	C19H25NO5	347.173
	C19H28O6	352.189
	C19H28O7	368.184
	C21H26O4	342.183
SOOA	C5H7NO3	129.043
	C6H4O3	124.016
	C6H7NO2	125.048
	C6H8O4	144.042
	C7H10O4	158.058
	C7H10O5	174.053
	C7H11NO4	173.069
	C7H12O4	160.074
	C7H12O5	176.069
	C7H2O5	165.99
	C7H8O4	156.042

C8H10O4	170.058
C8H10O5	186.053
C8H12O3	156.079
C8H12O4	172.074
C8H13NO4	187.085
C8H13NO6	219.074
C8H14O4	174.089
C8H14O5	190.084
C9H11NO5	213.064
C9H12O4	184.074
C9H12O5	200.069
C9H14O3	170.094
C9H14O4	186.089
C9H14O6	218.079
C9H15NO4	201.1
C9H15NO6	233.09
C9H16O4	188.105
C9H16O5	204.1
C10H14O4	198.089
C10H14O5	214.084
C10H16O4	200.105
C10H17NO6	247.106
C10H18O5	218.115
C11H16O4	212.105
C11H16O5	228.1
C11H18O4	214.121
C12H16O3	208.11
C12H20O4	228.136
C13H18O3	222.126
C13H20O4	240.136
C14H18O3	234.126
C14H19NO5	281.126

C14H20O3	236.141		C16H24O2	248.178
C15H20O3	248.141		C16H25NO4	295.178
C15H22O3	250.157		C16H26O2	250.193