Supporting Information for:

Emissions of Intermediate- and Semi-Volatile Organic Compounds (I/SVOCs) from Different Cumulative Mileage Diesel Vehicles under Various Ambient Temperatures

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Summary of the Supporting Information:

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Table S1. The list of 120 external standard curves used in this study.

No.	Groups	Name	Molecular Formula	Cas No.	R^2
1	Alkane	Heptane	C7H16	142-82-5	0.973
2	Alkane	Octane	C8H18	111-65-9	0.984
3	Alkane	Nonane	C9H20	111-84-2	0.996
4	Alkane	Decane	C10H22	124-18-5	0.995
5	Alkane	Undecane	C11H24	1120-21-4	0.992
6	Alkane	Dodecane	C12H26	112-40-3	0.973
7	Alkane	Tridecane	C13H28	629-50-5	0.975
8	Alkane	Tetradecane	C14H30	629-59-4	0.985
9	Alkane	Pentadecane	C15H32	629-62-9	0.987
10	Alkane	Hexadecane	C16H34	544-76-3	0.988
11	Alkane	heptadecane	C17H36	629-78-7	0.975
12	Alkane	Octadecane	C18H38	593-45-3	0.969
13	Alkane	Nonadecane	C19H40	629-92-5	0.987
14	Alkane	Eicosane	C20H42	112-95-8	0.961
15	Alkane	Heneicosane	C21H44	629-94-7	0.962
16	Alkane	Docosane	C22H46	629-97-0	0.976
17	Alkane	Tricosane	C23H48	638-67-5	0.971
18	Alkane	Tetracosane	C24H50	646-31-1	0.973
19	Alkane	Pentacosane	C25H52	629-99-2	0.995
20	Alkane	Hexacosane	C26H54	630-01-3	0.990
21	Alkane	Heptacosane	C27H56	593-49-7	0.977
22	Alkane	Octacosane	C28H58	630-02-4	0.982
23	Alkane	Nonacosane	C29H60	630-03-5	0.972
24	Alkane	Triacontane	C30H62	638-68-6	0.963
25	Alkane	Hentriacontane	C31H64	630-04-6	0.971
26	Alkane	Dotriacontane	C32H66	544-85-4	0.956
27	Alkane	Tritriacontane	C33H68	630-05-7	0.959
28	Alkane	Tetratriactoane	C34H70	14167-59-0	0.957
29	Alkane	Pentatriacontane	C35H72	630-07-9	0.989
30	Alkane	Hexatriacontane	C36H74	630-06-8	0.980
31	Alkane	Heptatriacontane	C37H76	7194-84-5	0.989
32	Alkene	Octene	C8H16	111-66-0	0.992
33	Alkene	Decene	C10H20	872-05-9	0.982
34	Alkene	Dodecene	C12H24	112-41-4	0.959
35	Alkene	Tetradecene	C14H28	1120-36-1	0.976
36	Alkene	Hexadecene	C16H32	629-73-2	0.985
37	Alkene	Octadecene	C18H36	112-88-9	0.986
38	Alkene	Eicosene	C20H40	3452-07-1	0.988
39	Alkene	Docosene	C22H44	1599-67-3	0.987
40	Alkyl-PAH	Methylnaphthalene	C11H10	90-12-0	0.997
41	Acid	Isobutyric Acid	C4H8O2	79-31-2	0.989

No.	Groups	Name	Molecular Formula	Cas No.	R^2
42	Acid	2-Methyl butyric acid	C5H10O2	116-53-0	0.986
43	Acid	Tetradecanoic acid	C11H22O2	544-63-8	0.981
44	Acid	heptadecanoic acid	C14H28O2	506-12-7	0.984
45	Acid	Undecanoic acid	C17H34O2	112-37-8	0.984
46	Alcohol	Decanol	C10H22O	112-30-1	0.982
47	Alcohol	Tridecanol	C13H28O	26248-42-0	0.987
48	Alcohol	Hexadecanol	C16H34O	36653-82-4	0.961
49	Alcohol	Nonadecanol	C19H40O	1454-84-8	0.953
50	Alcohol	Docosanol	C22H46O	661-19-8	0.994
51	Aldehyde	Valeraldehyde	C5H10O	110-62-3	0.966
52	Aldehyde	1-Pentanecarbaldehyde	C6H12O	66-25-1	0.996
53	Aldehyde	Octanal	C8H16O	124-13-0	0.995
54	Aldehyde	Decylaldehyde	C10H20O	112-31-2	0.994
55	Aldehyde	Dodecanal	C12H24O	112-54-9	0.957
56	Aldehyde	Tetradecanal	C14H28O	124-25-4	0.978
57	Aldehyde	Hexadecanal	C16H32O	629-80-1	0.955
58	Aldehyde	Octadecanone	C18H36O	638-66-4	0.968
59	Aldehyde	Icosanal	C20H40O	2400-66-0	0.959
60	Aldehyde	Docosanal	C22H44O	57402-36-5	0.952
61	Alkyl-PAH	Ethylnaphthalene	C12H12	1127-76-0	0.971
62	Amide	Acetamide	C2H5NO	60-35-5	1.000
63	Amide	Propanamide	C3H7NO	79-05-0	0.960
64	Amide	N,N-Dibutylformamide	C9H19NO	761-65-9	0.952
65	Amine	Triethylamine	C6H15N	121-44-8	0.986
66	Amine	Aniline	C6H7N	62-53-3	0.981
67	Amine	2-Aminoaniline	C6H8N2	95-54-5	0.997
68	Amine	Dibutylamine	C8H19N	111-92-2	0.990
69	Amine	1-Naphthalenamine	C10H9N	134-32-7	0.962
70	Amine	4-Biphenylamine	C12H11N	92-67-1	0.994
71	Aromatic	Ethylbenzene	C8H10	100-41-4	0.996
72	Aromatic	p-xylene	C8H10	106-42-3	0.993
73	Aromatic	o-xylene	C8H10	95-47-6	0.993
74	Aromatic	Isopropylbenzene	C9H12	98-82-8	0.995
75	Aromatic	4-Ethyltoluene	C9H12	622-96-8	0.982
76	Aromatic	1,3,5-trimethylbenzene	C9H12	108-67-8	0.993
77	Aromatic	p-Cymene	C10H14	99-87-6	0.966
78	Aromatic	butyl-benzene	C10H14	104-51-8	0.993
79	Aromatic	pentyl-benzene	C11H16	538-68-1	0.974
80	Aromatic	hexyl-benzene	C12H18	1077-16-3	0.973
81	Cycloalkane	Ethyl-cyclohexane	C8H16	1678-91-7	0.950
82	Cycloalkane	Butyl-cyclohexane	C10H20	1678-93-9	0.986
83	Cycloalkane	Hexyl-cyclohexane	C12H24	4292-75-5	0.968

No.	Groups	Name	Molecular Formula	Cas No.	R^2
84	Cycloalkane	Octyl-cyclohexane	C14H28	1795-15-9	0.950
85	Cycloalkane	Decyl-cyclohexane	C16H32	1795-16-0	0.955
86	Cycloalkane	Dodeyl-cyclohexane	C18H36	1795-17-1	0.974
87	Cycloalkane	Tetradecyl-cyclohexane	C20H40	1795-18-2	0.969
88	Cycloalkane	Hexadecyl-cyclohexane	C22H44	6812-38-0	0.979
89	Ester	Butyl acetate	C6H12O2	123-86-4	0.979
90	Ester	Isoamyl Acetate	C7H14O2	123-92-2	0.995
91	Ester	Amyl Acetate	C7H14O2	628-63-7	0.973
92	Furan	Furan	C4H4O	110-00-9	0.961
93	Ketone	2-Pentanone	C5H10O2	107-87-9	0.990
94	Ketone	3-Heptanone	C7H14O	106-35-4	0.995
95	Ketone	2-Nonanone	C9H18O	821-55-6	0.984
96	Ketone	2-Dodecanone	C12H24O	6175-49-1	0.972
97	Ketone	Pentadecanone	C15H30O	2345-28-0	0.986
98	Oxy-PAH	1,4-naphthoquinone	C10H6O2	130-15-4	0.994
99	Oxy-PAH	1-naphthaldehyde	C11H8O	66-77-3	0.982
100	Oxy-PAH	9,10-anthraquinone	C14H8O2	84-65-1	0.992
101	Oxy-PAH	benzo[a]anthracene-7,12-dione	C18H10O2	2498-66-0	0.983
102	PAH	Indene	C9H8	95-13-6	0.990
103	PAH	Naphthalene	C10H8	91-20-3	0.997
104	PAH	Acenaphthylene	C12H8	208-96-8	0.996
105	PAH	Acenaphthene	C12H10	83-32-9	0.989
106	PAH	Fluorene	C13H10	86-73-7	0.997
107	PAH	Phenanthrene	C14H10	85-01-8	0.994
108	PAH	Anthracene	C14H10	120-12-7	0.992
109	PAH	Pyrene	C16H10	129-00-0	0.992
110	PAH	Benz[a]anthracene	C18H12	56-55-3	0.973
111	PAH	Chrysene	C18H12	218-01-9	0.973
112	PAH	Benzo[b]fluoranthene	C20H12	205-99-2	0.961
113	PAH	Benzo[k]fluoranthene	C20H12	207-08-9	0.983
114	PAH	Benzo[a]pyrene	C20H12	50-32-8	0.967
115	PAH	Indeno[1,2,3-cd]fluoranthene	C22H12	193-39-5	0.991
116	Pinene	(+)-alpha-Pinene	C10H16	7785-70-8	0.950
117	Pinene	β-Pinene	C10H16	18172-67-3	0.991
118	Polyphenyls	Biphenyl	C12H10	92-52-4	0.952
119	Polyphenyls	p-terphenyl	C18H14	92-94-4	0.967
120	Polyphenyls	p-quaterphenyl	C24H18	135-70-6	0.987

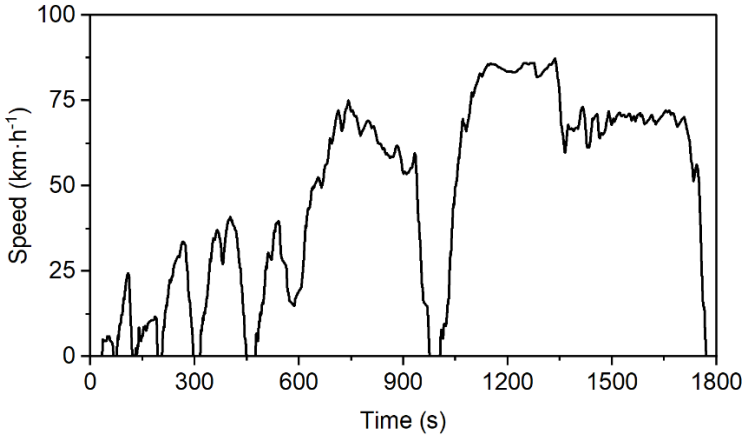

Figure S1. CHTC-TT test cycle for tractor trailers. The cycle lasts 1800 s, with the first 473 s as phase 1 and the last 1327 s as phase 2. The total driving distance is about 23 km, and the maximum speed is 88 km·h^{-1}.

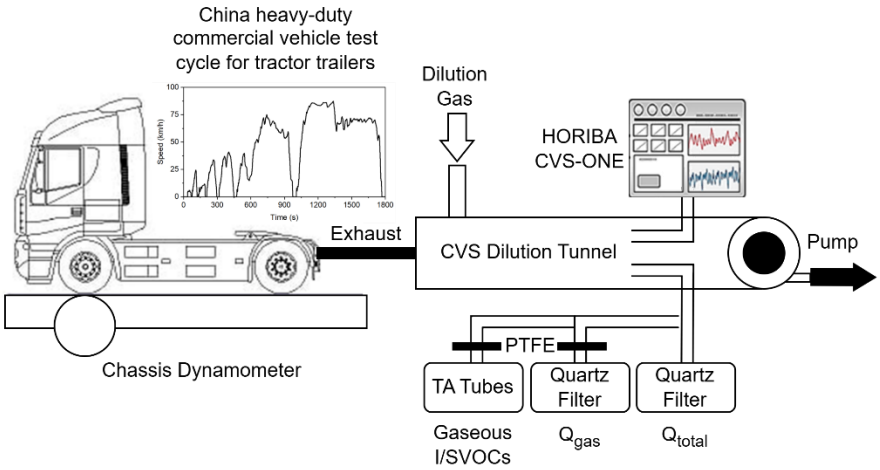

Figure S2. A schematic of the sampling systems.

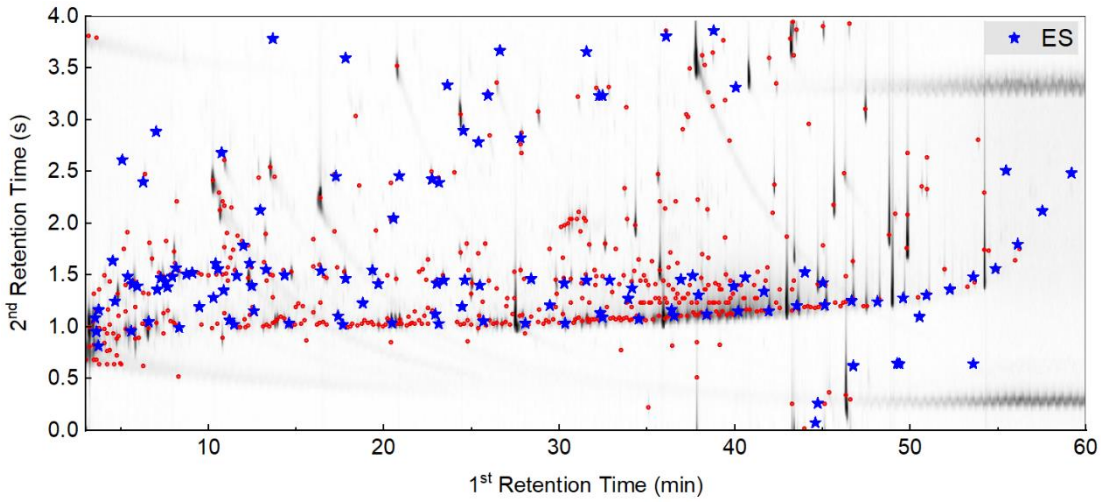

Figure S3. Actual GC×GC chromatogram and sample chromatographic peaks (the red dots). The blue stars represent all ES used in this study including n-alkanes, PAHs, carbonyls, etc. All their

detailed information was listed in Table S1.

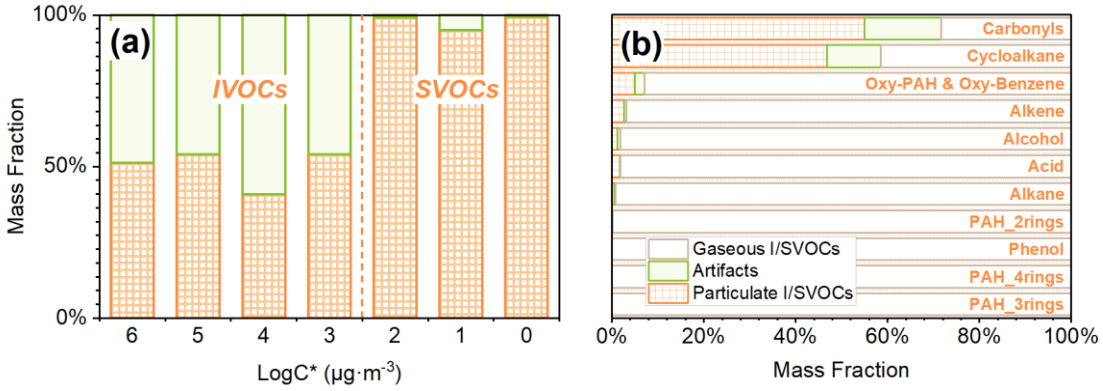

Figure S4.(a) The mass fraction of artifacts and particulate I/SVOCs divided by C* captured by quartz. (b) Gas-particle partition and artifacts of various organic compound groups.

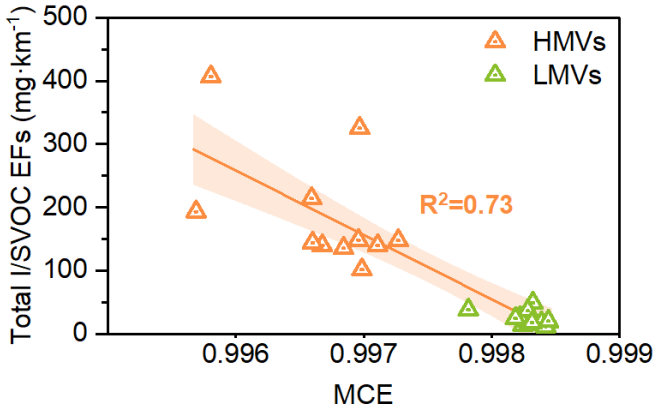

Figure S5. The linear correlation between total I/SVOC EFs and MCE.

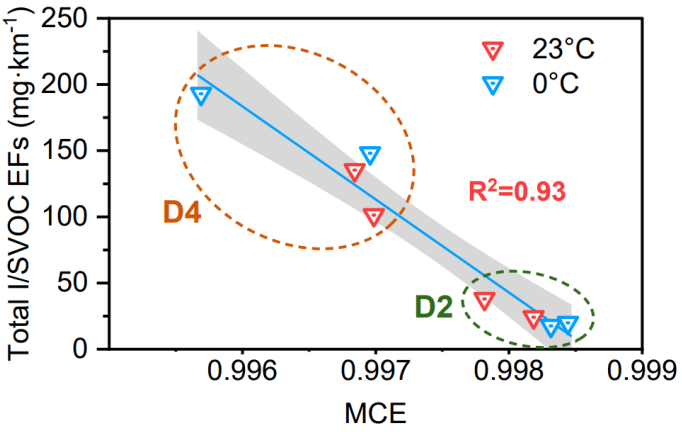

Figure S6. The linear correlation between hot-start cycle I/SVOC EFs and MCE of LMV (D2) and HMV (D4) at different ambient temperatures.