Supplement of

Aerosol and VOC emission factor measurements for African anthropogenic sources

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Figure S1: linear regression analysis of each carbonaceous particle values obtained for thermal (coulo) and thermo-optical (DRI) methods

Table S1: GEIA VOC species groups (Huang et al., 2017)

Class	VOCs species
VOC1	Alkanols (alcohols)
VOC2	Ethane
VOC3	Propane
VOC4	Butanes
VOC5	Pentanes
VOC6	Hexanes and higher alkanes
VOC7	Ethene (ethylene)
VOC8	Propene
VOC9	Ethyne (acetylene)
VOC10	Isoprenes
VOC12	Other alk(adi)enes/alkynes (olefines)
VOC13	Benzene (benzol)
VOC14	Methylbenzene (toluene)
VOC15	Dimethylbenzenes (xylenes)
VOC16	Trimethylbenzenes
VOC17	Other aromatics
VOC18	Esters
VOC19	Ethers (alkoxy alkanes)
VOC20	Chlorinated hydrocarbons
VOC21	Methanal (formaldehyde)
VOC22	Other alkanals (aldehydes)
VOC23	Alkanones (ketones)
VOC24	Acids (alkanoic)
VOC25	Other NMVOC (HCFCs, nitriles, etc.)

Table S2: EFs of emission sources grouped by VOC speciation of GEIA

EF (g/kgdm)	HDDV	LDDV	LDGV	TW 2T	TW 4T	FW	CHM	WB	CH
VOC6	1.07±0.23	0.60±0.13	2.84±0.20	1148±337	22.5±3.43	2.79±0.93	5.34±1.49	16.0±7.09	1.84±0.49
VOC10	0.02±0.02	0.06±0.06	0.41±0.35	28.3±28.6	1.98±0.85	1.70±1.69	0.70±0.25	2.67±4.33	0.20±0.21
VOC11	0.17±0.04	0.03±0.00	0.06±0.02	53.2±20.5	0.36±0.07	1.94±0.64	0.37±0.11	69.5±26.3	2.03±1.11
VOC12	0.00±0.00	0.21±0.02	2.09±1.02	87.9±106	0.10±0.05	0.00±0.00	0.12±0.12	1.58±2.14	0.27±0.42
VOC13	0.68±0.27	5.57±2.80	4.78±0.37	380±279	32.0±8.56	2.00±1.99	4.20±0.12	19.1±19.0	8.64±11.9
VOC14	0.58±0.18	3.10±1.80	34.8±18.6	1135±830	95.1±32.2	1.53±1.52	4.64±2.02	35.5±45.6	3.60±4.30
VOC15	1.01±0.20	1.62±0.25	93.5±2.25	2127±673	81.3±15.2	1.59±0.79	3.37±0.98	5.86±4.52	2.69±1.26
VOC16	2.13±0.52	2.96±0.21	51.2±0.59	1916±437	46.3±7.00	0.78±0.26	2.89±0.34	4.35±1.92	7.87±4.30
VOC17	0.25±0.11	0.82±0.37	15.6±3.15	815±591	40.6±16.2	0.24±0.24	0.81±0.25	27.9±34.3	1.74±2.07

Table S3: EFs of emission sources grouped by VOC speciation of GEIA for 50 compounds

EF (g/kgdm)	HDDV	TW 2T	FW	CHM	CH
VOC5	0.07	331.2	0.15	1.03	0.25
VOC6	115.3	6659	10.4	23.8	10.8
VOC10	0.34	46.10	3.39	0.87	0.09
VOC11	19.4	574.7	4.83	3.81	1.06
VOC12	0.92	187.6	0.00	0.45	0.12
VOC13	20.8	617.7	3.99	8.26	3.56
VOC14	9.79	1841	3.05	12.7	1.56
VOC15	12.0	3220	3.17	10.2	1.18
VOC16	22.5	2847	1.55	5.68	3.61
VOC17	4.42	1953	1.30	3.72	1.15
VOC22	33.4	665.7	2.26	17.3	3.53
VOC23	1.14	10.69	0.44	15.2	0.36
IVOCs	80.32	95.07	1.17	6.32	0.73

Table S4: NMVOC-EFs from diesel and gasoline light- and heavy-duty vehicles and wood burning in this study and literature

EF	HDDV	std	LDDV	std	LDGV	std	FW	std	Gasoline_HDL	std	std	std	WB maximum	std	WB maximum	std
Unit	(g/kgdm)		(g/kgdm)		(g/kgdm)		(g/kgdm)		g/L		g/L		g/L		g/kg	
Reference	This study								Gentner et al., 2016				Evtugina et al, 2015		McDonald et al., 2000	
heptane	0.23	0.16	0.18	0.13	0.44	0.15	0.04	0.04	0.042				0.019	0.002	0.005	0.003
octane	0.74	0.46	0.21	0.1	2.36	0.4	2.38	2.3	0.020	0.001	0.004	0.003	0.005	0.001	0.004	0.003
iso-octane	0.09	0.07	0.21	0.15	0.04	0.03	0.37	0.6	0.067	0.032	0.000	0.000				
benzene	0.68	0.27	5.6	2.8	4.78	0.4	2	1.98	0.227	0.012	0.006	0.005	0.901	0.131	0.312	0.083
toluene	0.58	0.17	3.1	1.8	34.7	18.6	1.53	1.52	0.226	0.014	0.022	0.013	0.326	0.047	0.142	0.004
m+p-xylene	0.7	0.26	1.06	0.27	63.4	1.07	1.43	1.42	0.079	0.004	0.007	0.004	0.040	0.007	0.041	0.012
o-xylene	0.32	0.15	0.56	0.22	30.1	3.43	0.16	0.47	0.057	0.004	0.004	0.003	0.027	0.002		
ethylbenzene	0.25	0.11	0.82	0.37	15.6	3.15	0.24	2.07	0.033	0.004	0.009	0.005	0.053	0.006		
135-TMB	0.33	0.21	0.52	0.14	10.8	0.56	0.07	0.02	0.019	0.000	0.015	0.008	0.001	0.000		
124-TMB	1.29	0.96	1.73	0.34	34.6	0.84	0.06	0.08	0.093	0.001	0.046	0.024				
123-TMB	0.5	0.4	0.71	0.14	5.84	0.36	0.65	12.7								
isoprene	0.02	0.02	0.06	0.06	0.41	0.35	1.69	0.2				0.111		0.016	0.027	0.013
limonene	0.07	0.06	0.02	0.01	0	0	1.91	1.87				0.001		0.001	0.018	0.027
a-pinene	0.04	0.02	0	0	0.01	0.01	0	1.5				0.009		0.004	0.004	0.004
b-pinene	0.06	0.05	0.01	0	0.05	0.03	0.03	1.72								