Supplement for:

Development of an integrated source-profile dataset of high reactivity organic gases (HROG) for anthropogenic sources in China

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Contents

Table S1. Source classification used in this study.

Table S2. Overview of source categories, test platforms, sample sizes and data sources for the HROG source-profile dataset.

Table S3. Detailed information of the test diesel vehicles used in chassis dynamometer tests.

Table S1. Source classification used in this study.

Source classification				Abbreviation	ID	No. of samples
1st level	2nd level	3rd level	4th level			
Industrial process sources	Petrolcum refining	Bulk loading	−	IPB	1	2
		Storage Tanks	−	IPS	2	8
		Process devices	−	IPP	3	7
		Waste treatment	−	IPW	4	10
	Chemical manufacturing	Organic chemical production	Waste treatment	IOW	5	23
			Storage Tanks	IOS	6	10
			Process devices	IOP	7	12
		Ink production	−	ICI	8	2
		Rubber products	−	ICR	9	2
		Pesticide production	−	ICP	10	10
		Fertilizer	Synthetic ammonia	IFS	11	2
			Urea	IFU	12	1
	Coking	Coke production	−	ICC	13	1
	Wood processing	Plywood	−	IWP	14	1
	Non-metallic mineral manufacturing	Glass products	Glass fiber	ING	15	3
Solvent use sources	Solvent use Industry	Furniture manufacturing	−	SIF	16	1
		Packaging printing	−	SIP	17	3
		Machinery manufacturing	−	SIM	18	5
	Solvent-based coating products	Floor	−	SSF	19	4
		Industry	−	SSI	20	41
		Wood	−	SSW	21	18
		Vehicle	−	SSV	22	22
	Water-based coating products	Floor	−	SWF	23	4
		Industry	−	SWI	24	25
		Wood	−	SWW	25	16
		Vehicle	−	SWV	26	8
		Wall	−	SWA	27	5
Vehicle exhaust sources	Diesel exhaust	China IV	−	VDIV	28	8
		China V	−	VDV	29	20
		China VI	−	VDVI	30	14
	Gasoline exhaust	China I~III	−	VGIII	31	26
		China IV	−	VGIV	32	16
		China V	−	VGV	33	15
		China VI	−	VGVI	34	16
Fuel evaporation sources	Gasoline evaporation	China III	−	VEIII	35	2
		China IV	−	VEIV	36	2
		China V	−	VEV	37	2
		China VI	−	VEVI	38	2
Residential sources	Coal combustion	Anthracite coal	−	RCA	39	6
		Briquette coal	−	RCB	40	6
	Biomass combustion	Firewood	−	RBF	41	8
		Straw	−	RBS	42	3
		Corncob	−	RBC	43	1
		Corn straw	−	RBCS	44	1
		Bean straw	−	RBB	45	1

Table S2. Overview of source categories, test platforms, sample sizes and data sources for the HROG source-profile dataset.

Source category	Representative subclasses	Test platforms	No. of samples / units	Data source
Industrial process	Petroleum refining, organic chemical manufacturing, pesticide, ink, rubber, Fertilizer, coking, plywood, Glass fiber	◆ Field sampling after control devices ◆ Offline canister + G/P/H[a]	94 samples (15 subclasses)	This study
Solvent use – industry	Furniture manufacturing, packaging printing, machinery manufacturing	◆ Same protocol as above	9 samples (3 subclasses)	This study
Solvent use – coatings	Floor, wall, wood, vehicle, industrial protective coatings; solvent-based and water-based coatings	◆ Custom-built vaporizer ◆ Online P/H[b] ◆ Offline canister + G[c]	143 samples (replicates)	This study
Diesel exhaust	HDDT (China IV–VI) and bus	◆ Chassis dynamometer system ◆ Online P/H ◆ Offline canister + G/P/H	42 samples (replicates)	This study
Gasoline exhaust	LDGV (China 3–6)	◆ Chassis dynamometer system ◆ Online P/H ◆ Offline canister + G	73 samples (replicates)	(Wang et al., 2022; Huang et al., 2024)
Fuel evaporation	LDGV (China 3–6); hot-soak and diurnal breathing losses (48 h)	◆ Housing evaporative determination unit ◆ Online P ◆ Offline canister + G	8 samples	(Lu et al., 2025)
Residential combustion	Coal (anthracite, briquette), biomass (firewood, straw such as corncob, Corn straw, Bean straw)	◆ Real-world household stoves ◆ Offline canister + G/P/H	23 samples	(Gao et al., 2023)

[a] Offline canister + G/P/H: Offline canister sampling and analysis by GC-MS/FID, PTR-ToF-MS and HCHO analyser.

[b] Online P/H: Online PTR-ToF-MS and HCHO analyser.

[c] Offline canister + G: Offline canister sampling and analysis by GC-MS/FID.

Table S1. Detailed information of the test diesel vehicles used in chassis dynamometer tests.

Number	Fuel type	Vehicle type	Emission standard	Model year	Odomete |10^4 km	Displacement |L
1	Diesel	HDDT[a]	China IV	2016	19.00	4.04
2				2014	39.00	3.76
3				2015	25.60	5.90
4				2014	40.30	9.73
5			China V	2020	28.12	7.53
6				2020	26.00	7.53
7				2020	N/A[b]	7.53
8				2020	8.70	3.80
9				2020	13.00	3.80
10				2020	6.90	6.87
11				2020	9.00	5.70
12				2020	10.40	6.87
13				2020	23.00	10.50
14				2021	7.70	9.50
15			China VI	2022	8.00	10.52
16				2022	4.40	10.50
17				2022	6.90	10.50
18				2022	0.19	10.52
19				2022	1.30	11.60
20				2021	0.91	12.90
21		BUS	China VI	2022	N/A	9.50[c]

a: HDDT stands for heavy-duty diesel truck.
b: N/A stands for “not available”.
c: All vehicles were tested twice, except for this one.

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