

## Supplementary Material

### Organophosphate esters (OPEs) in atmospheric particulate matter in different Brazilian regions

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Number of pages: 5

Number of tables: 5

## Table of Contents

<b>Table S1.</b> CAS number and purity of standards. ....	3
<b>Table S2.</b> MDL, MQL, recovery e relative standard deviation (RSD).....	3
<b>Table S3.</b> Retention time, quantification ion and confirmation ion used in SIM detection for each OPE.....	3
<b>Table S4.</b> Retention time, precursor ion and product ion used in MS/MS detection for each OPE. ....	4
<b>Table S5.</b> OPEs concentration in PM <sub>10</sub> in Catalão, Limeira and Novo Hamburgo. ....	5

**Table S1.** CAS number and purity of standards.

Standards	CAS#	Purity of standards (%)
TNBP	126-73-8	99.5
TCEP	115-96-8	99
TCIPP	13674-84-5	95.5
TDCIPP	13674-87-8	95.9
TPHP	115-86-6	99.5
TBOEP	78-51-3	95.6
EHDPHP	1241-94-7	90
TEHP	78-42-2	98
TMPP	1330-78-5	99.4

**Table S2.** MDL, MQL, recovery e relative standard deviation (RSD).

Compounds	MDL (ng m <sup>-3</sup> )	MQL (ng m <sup>-3</sup> )	REC (%)	RSD (%)
TNBP	0.004	0.014	116	18
TCEP	0.020	0.061	124	15
TCIPP	0.009	0.029	134	23
TDCIPP	0.020	0.066	109	7
TPHP	0.002	0.013	120	34
TBOEP	0.020	0.061	89	10
EHDPHP	0.023	0.056	80	17
TEHP	0.007	0.024	66	21
TMPP	0.011	0.036	89	5

**Table S3.** Retention time, quantification ion and confirmation ion used in SIM detection for each OPE.

Compounds	Retention time (min)	Quantification ion (m/z)	Confirmation ion (m/z)
TNBP	18.7	103	99
TCEP	20.3	249	251; 99
TCIPP	20.2	201	125; 99
TDCIPP	25.6	381	191; 99
TPHP	26.1	325	233; 326
TBOEP	26.1	125	199; 99
EHDPHP	26.2	251	249
TEHP	26.4	99	113
TMPP	28.2	367	261; 368

**Table S4.** Retention time, precursor ion and product ion used in MS/MS detection for each OPE.

Compounds	Retention time (min)	Precursor ion (m/z)	Product ion (m/z)
TNBP	18.7*	99	81
TCEP	20.3*	249	125
	20.3**	125	99
TCIPP	20.2*	201	125
	20.2**	99	81
TDCIPP	25.6*	191	155
	25.6**	99	81
TPHP	26.1*	233	215
	26.1**	326	228
TBOEP	26.1*	199	125
	26.1**	99	81
EHDPHP	26.2*	251	215
	26.2**	251	155
TEHP	26.4**	99	81
	28.2*	261	243
TMPP	28.2**	367	331
	28.2**	368	261

\* Quantification ion \*\* Confirmation ion

MS/MS reactions obtained using automatic fragmentation mode (Xcalibur Software)

**Table S5.** OPEs concentration in PM<sub>10</sub> in Catalão, Limeira and Novo Hamburgo.

City	Date	PM <sub>10</sub> concentration ( $\mu\text{g m}^{-3}$ )	Temperature (°C)	Relative humidity (%)	Wind speed (km/h)	Pressure (mmHg)	Concentration of compounds (ng m <sup>-3</sup> )				
							TNBP	TDCIPP	TPHP	TBOEP	EHDPHP
Catalão	Jun 12, 2019	30	20.6	61	6.5	689	1.3		0.27	0.11	<MQL
	Jun 18, 2019	30	21.1	54	6.1	689	1.3		0.30		0.049
	Jun 30, 2019	16	21.2	58	7.2	688	0.36		0.13		
	Jul 6, 2019	13	16.9	59	6.5	689	0.35		0.037		<MQL
	Jul 12, 2019	34	21.2	44	5.0	688	0.38		0.18		0.034
	Jul 18, 2019	51	19.5	61	9.0	690	0.19		0.20		0.034
	Jul 24, 2019	27	21.0	54	7.2	689	0.26		0.17		<MQL
	Jul 30, 2019	25	21.5	47	5.8	688	0.21		0.10		<MQL
Limeira	Jun 7, 2019	28	17.9	44	0.6	709			0.33	0.13	0.11
	Jun 12, 2019	49	20.7	36	0.3	708			0.48	0.23	0.096
	Jun 18, 2019	53	20.2	41	0.2	707		0.22	0.65	0.11	0.084
	Jun 24, 2019	31	20.8	36	0.2	705		0.28	0.90		0.066
	Jun 30, 2019	38	22.7	37	0.6	706			0.41		0.071
	Jul 6, 2019	6.6	10.6	42	0.2	710			0.096		
	Jul 12, 2019	70	18.9	31	0.0	707			0.84	0.14	0.12
	Jul 18, 2019	24	16.5	32	0.2	711			0.43		0.12
	Jul 24, 2019	59	20.0	34	0.3	708			0.90	0.076	0.13
	Jul 30, 2019	45	21.0	32	0.3	707		0.10	0.44	0.13	0.12
Novo Hamburgo	Jun 12, 2019	24	15.3		2.1	764				0.079	0.093
	Jun 18, 2019	33	19.7		3.4	760				0.19	0.16
	Jun 30, 2019	14	23.1		2.7	757					<MQL
	Jul 6, 2019	19	8.1		13.8	769					<LOQ
	Jul 13, 2019	31	18.6		3.1	759				0.11	0.064
	Jul 18, 2019	31	13.1		1.0	767				0.56	0.081
	Jul 24, 2019	11	17.4		2.4	763				0.26	<MQL
	Jul 30, 2019	20	17.7		2.4	761				0.11	<MQL

Note: blanks in the table refer to undetected compounds