**Supplementary Information**

**Influence of north-easterly monsoon on carbonaceous particles and polycyclic aromatic hydrocarbons in PM2.5 in the City of Kuala Lumpur, Malaysia**

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1. **Synthesis of n-octyl-triethoxysilane functionalized nanoparticles**

N-octyl-triethoxysilane functionalized nanoparticles were prepared to be used in PAHs extraction. Briefly, FeSO4 and FeCl3 (molar ratio 2:3) were dissolved in 50 mL of deionized water. magnetic nanoparticles (MNPs) were precipitated by adding 50 mL of ammonium solution (25%) to the mixture of FeSO4 and FeCl3 under vigorous stirring. After 30 minutes, the (MNPs) were collected by sedimentation with the help of an external magnetic field and washed with deionized water followed by methanol. The synthesized MNPs were then dried under vacuum at room temperature. The synthesis procedure of MNPs was adopted from Tay et al. (2013).

**1.1 Surface modification of MNPs**

Total of 2 g of the synthesized MNPs, 5 g of n-octyl-triethoxysilane, 0.1 mL of triethylamine, and 25 mL of toluene were swirled for 10 minutes under a nitrogen atmosphere. Then, the mixture was refluxed for 24 hours under a nitrogen atmosphere. Modified magnetic nanoparticles (C8MNPs) was collected with the help of an external magnetic field and washed with toluene followed by methanol. Finally, the C8MNPs were dried under vacuum at room temperature.

**1.2 FTIR analysis for MNPs and C8MNPs**

Both of modified and unmodified magnetic nanoparticles were analysed using FTIR spectroscopy. FTIR is a technique which the samples are mixed with potassium bromide (KBr) powder as matrix (holder). The sample and KBr powder were grinded together until it become homogenous mixture. Then, thin layer of the mixture was placed into the Manual Hydraulic Press (Specac). The mixture then pressed with pressure 10 ton and hold for 10 seconds. A good pellet is thin and transparent that can allow the infrared beam passes through the pellet. Opaque pellet will give poor spectra because little infrared beam passes through them.

**1.3 Characterisation of magnetic nanoparticles (MNPs)**

The magnetic nanoparticles that had been synthesised was characterised using Fourier-transform infrared spectroscopy (FTIR). After MNPs synthesised, the surface of the MNPs was modified to enhance the stability of MNPs. **Figure S4** shows the spectra of MNPs and C8MNPs in the wavelength range of 4000 and 400 cm-1. From the spectra, both MNPs and C8MNPs has peak at 581 cm-1 and 3408 cm-1 indicating Fe-O stretching and O-H stretching vibration respectively. The FTIR spectra for magnetic nanoparticles that has been modified is slightly different from the unmodified magnetic nanoparticles. This is because in modified nanoparticles (C8MNPs), there are peaks at 1000 cm-1 that indicates Si-O bonding and peak at 2924 cm-1 that represent C-H stretching in n-octyl-triethoxysilane. These peaks are similar with the spectra peaks from a previous study (Tay et al., 2013).

**Table S1:** Sampling date and flow rate of high-volume sampler for each sampling area

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sampling Date | Station Name | | | | | |
| KKKL | | Wisma SCA | | DBKL | |
| Filter ID | Flowrate  (m3/min) | Filter ID | Flowrate  (m3/min) | Filter ID | Flowrate  (m3/min) |
| 21/01/2019 | PS2573 | 1.418 | PS2184 | 1.357 | PS2649 | 1.189 |
| 28/01/2019 | PS2575 | 1.416 | PS2957 | 1.303 | PS2920 | 1.189 |
| 03/02/2019 | PS2577 | 1.416 | PS2932 | 1.246 | PS2922 | 1.189 |
| 21/02/2019 | PS2825 | 1.416 | PS2926 | 1.133 | PS2906 | 1.189 |
| 11/03/2019 | PS2831 | 1.416 | PS2846 | 1.189 | PS2913 | 1.189 |
| 17/03/2019 | PS2833 | 1.416 | PS3039 | 1.189 | PS2840 | 1.189 |

**Table S2:** Potential sources of PAHs based on the Diagnostic ratios (DRs)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Indicator sources | Diagnostic ratios (DRs) | | | | |
| Ant/ Ant + Phe a,b, | Flt/ Flt + Pyr a,c | B[a]A/ B[a]A + Chr a,d,e | I[c]P/ I[c]P + B[g]P a,b | B[a]P/B[g]P a,b |
| Petrogenic | < 0.1 | < 0.4 | < 0.2 | < 0.2 | - |
| Pyrogenic | > 0.1 | > 0.4 | > 0.35 | > 0.2 | - |
| Grass, wood, coal | - | > 0.5 | - | > 0.5 | - |
| Diesel | - | - | - | 0.35-0.7 | - |
| Oil combustion | - | - | - | 0.82 | - |
| Coal | - | - | 0.2-0.35 | - | - |
| Wood burning | - | - | > 0.5 | - | - |
| Non traffic | - | - | - | - | < 0.6 |
| Traffic | - | - | - | - | > 0.6 |
| This study | - | 0.55 (0.49-0.60) | 0.58 (0.47-0.81) | 0.60 | 0.82 |

a Yunker et al. (2002)

b Brändli ett al. (2008)

c De La Torre et al. (2009)

d Manoli et al. (2004)

e Akyüz and Cabuk, (2010)

**Table S3:** Table of constants value based on group ages.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Unit | Infant | Toddler | Children | Adolescent | Adult |
| IR | m3/day | 5.4 | 9 | 12 | 15.7 | 15.7 |
| ED | years | 1 | 5 | 6 | 6 | 24 |
| EF | days/year | 350 | 350 | 350 | 350 | 350 |
| BW | kg | 7 | 15 | 31.2 | 38 | 70 |
| AT | years | 70\*,1\*\* | 70,5 | 70,6 | 70,6 | 70,24 |

\*AT for carcinogens (fixed at 70 years of exposure)

\*\*AT for non-carcinogens (Average years of exposure)

As proposed by EPA (2001)

**Table S4:** Value of inhalation unit risk (IUR). (Silvia et al. (2014))

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Compound | IUR  (µg m-3)-1 | Compound | IUR  (µg m-3)-1 | Compound | IUR  (µg m-3)-1 |
| Nap | 3.40E-05 | Flt | 1.10E-06 | B[k]F | 1.10E-04 |
| Ace | 1.10E-06 | Pyr | 1.10E-06 | B[a]P | 1.10E-03 |
| Flr | 1.10E-06 | B[a]A | 1.10E-04 | B[h]A | 1.20E-03 |
| Phe | 1.10E-06 | Chr | 1.10E-05 | B[g]P | 1.10E-05 |
| Ant | 1.10E-05 | B[b]F | 1.10E-04 | I[c]P | 1.10E-04 |

**Table S5:** Value of for different PAHs compounds

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Compound | Ace | Flr | Ant | Flt | Pyr | B[a]P | B[g]Pa |
| (ng/kg.day) | 60000 | 40000 | 300000 | 40000 | 30000 | 300 | 30000 |
| (mg/kg.day) | 0.06 | 0.04 | 0.3 | 0.04 | 0.03 | 0.0003 | 0.03 |

a RfD value proposed by Michigan Department of Environmental Quality (https://www.michigan.gov/deq).

Other RfD were referred in Integrated Risk Information System of the US EPA (https://www.epa.gov/iris).

**Table S6**: Secondary organic carbon (SOC) concentration for each filter samples.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sample ID | (OC/EC) | EC (µg/m3). | OC (µg/m3) | SOC (µg/m3) |
| PS2573 | 1.7674 | 2.1583 | 3.8146 | 1.15 |
| PS2575 | 2.1029 | 1.4855 | 3.1239 | 1.29 |
| PS2184 | 1.8447 | 2.5294 | 4.6662 | 1.54 |
| PS2957 | 1.2813 | 2.8810 | 3.6914 | 0.13 |
| PS2649 | 1.5075 | 3.8892 | 5.8632 | 1.06 |
| PS2920 | 1.2361 | 3.3741 | 4.1707 | 0.00 |
| PS2577 | 3.0416 | 1.3153 | 4.0006 | 2.37 |
| PS2825 | 1.2416 | 3.6620 | 4.5468 | 0.02 |
| PS2932 | 2.2558 | 2.8336 | 6.3920 | 2.89 |
| PS2926 | 1.7999 | 3.2951 | 5.9309 | 1.86 |
| PS2922 | 1.9427 | 2.7635 | 5.3686 | 1.95 |
| PS2906 | 1.6309 | 3.7484 | 6.1133 | 1.48 |
| PS2831 | 1.3882 | 3.4470 | 4.7850 | 0.52 |
| PS2833 | 2.1559 | 4.3287 | 9.3324 | 3.98 |
| PS2846 | 1.3795 | 5.5150 | 7.6081 | 0.79 |
| PS3039 | 3.5283 | 6.8241 | 24.0773 | 15.64 |
| PS2913 | 1.2371 | 5.6195 | 6.9517 | 0.01 |
| PS2840 | 2.0437 | 6.5845 | 13.4568 | 5.32 |

**Table S7:** Water soluble organic carbon (WSOC) measured as TOC, inorganic carbon (IC) and total carbon (TC) concentration **(**µg/m3)

|  |  |  |  |
| --- | --- | --- | --- |
| Filter ID | TOC µg/m3 | IC µg/m3 | TC µg/m3 |
| PS2573 | 1.3879 | -0.1356 | 1.2528 |
| PS2575 | 0.6270 | -0.1259 | 0.5021 |
| PS2577 | 0.9157 | -0.0255 | 0.8907 |
| PS2825 | 2.2656 | -0.1563 | 2.1118 |
| PS2831 | 1.7024 | -0.1028 | 1.6011 |
| PS2833 | 3.6395 | 0.0118 | 3.6517 |
| PS2184 | 1.6968 | -0.0850 | 1.6118 |
| PS2957 | 1.0898 | -0.0128 | 1.0792 |
| PS2932 | 2.4434 | 0.0338 | 2.4769 |
| PS2926 | 1.0886 | 0.0241 | 1.1163 |
| PS2846 | 4.4654 | -0.1012 | 4.3636 |
| PS3039 | 9.1242 | 0.0220 | 9.1477 |
| PS2649 | 3.1480 | 0.0232 | 3.1738 |
| PS2920 | 1.0547 | 0.1515 | 1.2070 |
| PS2922 | 2.1186 | 0.1041 | 2.2250 |
| PS2906 | 2.5702 | 0.1437 | 2.7147 |
| PS2913 | 3.1880 | -0.1400 | 3.0480 |
| PS2840 | 6.5525 | -0.1744 | 6.3787 |

**Table S8:** B[a]Peq concentration for each compound and the overall statistics of the B[a]Peq.

|  |  |
| --- | --- |
| Compound | ng/m3 |
| Ace | 0.001 |
| Flr | 0.002 |
| Ant | 0.023 |
| Flt | 0.002 |
| Pyr | 0.002 |
| B[a]A | 0.197 |
| Chr | 0.015 |
| B[b]F | 0.364 |
| B[k]F | 0.187 |
| B[a]P | 1.63 |
| I[c]P | 0.189 |
| B[h]A | 1.20 |
| B[g]P | 0.007 |
| ∑ B[a]Peq | 3.82 |
| Average | 0.293 |
| Min | 0.001 |
| Max | 1.62 |

**Table S9:** Statistical Table of lifetime average daily dose (LADD) for cancer risk.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group Age | Variable | Valid N | (mg/kg day) | | | |
| Mean | Min | Max | Stdev |
|  | Ace | 3 | 3.46×10-9 | 4.94×10-10 | 6.77×10-9 | 3.15×10-9 |
|  | Flr | 8 | 2.19×10-9 | 3.84×10-10 | 9.41×10-9 | 3.22×10-9 |
|  | Ant | 10 | 2.46×10-9 | 7.21×10-10 | 1.12×10-8 | 3.36×10-9 |
|  | Flt | 10 | 1.70×10-9 | 4.98×10-10 | 1.02×10-8 | 3.02×10-9 |
|  | Pyr | 9 | 2.02×10-9 | 4.28×10-10 | 9.60×10-9 | 3.08×10-9 |
|  | B[a]A | 5 | 4.16×10-9 | 1.45×10-9 | 1.01×10-8 | 3.44×10-9 |
| Infant | Chr | 7 | 2.19×10-9 | 1.24×10-9 | 3.05×10-9 | 5.92×10-10 |
|  | B[b]F | 12 | 3.20×10-9 | 1.56×10-9 | 4.01×10-9 | 7.16×10-10 |
|  | B[k]F | 5 | 3.96×10-9 | 3.02×10-9 | 4.44×10-9 | 5.50×10-10 |
|  | B[a]P | 4 | 4.29×10-9 | 2.26×10-9 | 6.15×10-9 | 1.60×10-9 |
|  | I[c]P | 2 | 1.00×10-8 | 8.56×10-9 | 1.14×10-8 | 2.04×10-9 |
|  | B[h]A | 1 | 1.27×10-8 | 1.27×10-8 | 1.27×10-8 | - |
|  | B[a]P | 1 | 7.55×10-9 | 7.55×10-9 | 7.55×10-9 | - |
|  | Total PAHs | 13 | 1.84×10-8 | 1.56×10-9 | 1.05×10-7 | 2.83×10-8 |
|  | Ace | 3 | 1.34×10-8 | 1.92×10-9 | 2.63×10-8 | 1.23×10-8 |
|  | Flr | 8 | 8.53×10-9 | 1.49×10-9 | 3.66×10-8 | 1.25×10-8 |
|  | Ant | 10 | 9.56×10-9 | 2.80×10-9 | 4.34×10-8 | 1.31×10-8 |
|  | Flt | 10 | 6.61×10-9 | 1.94×10-9 | 3.99×10-8 | 1.17×10-8 |
|  | Pyr | 9 | 7.84×10-9 | 1.67×10-9 | 3.73×10-8 | 1.20×10-8 |
|  | B[a]A | 5 | 1.62×10-8 | 5.63×10-9 | 3.93×10-8 | 1.34×10-8 |
| Toddler | Chr | 7 | 8.52×10-9 | 4.83×10-9 | 1.19×10-8 | 2.30×10-9 |
|  | B[b]F | 12 | 1.25×10-8 | 6.08×10-9 | 1.56×10-8 | 2.78×10-9 |
|  | B[k]F | 5 | 1.54×10-8 | 1.17×10-8 | 1.73×10-8 | 2.14×10-9 |
|  | B[a]P | 4 | 1.67×10-8 | 8.77×10-9 | 2.39×10-8 | 6.21×10-9 |
|  | I[c]P | 2 | 3.89×10-8 | 3.33×10-8 | 4.45×10-8 | 7.92×10-9 |
|  | B[h]A | 1 | 4.94×10-8 | 4.94×10-8 | 4.94×10-8 | - |
|  | B[g]P | 1 | 2.94×10-8 | 2.94×10-8 | 2.94×10-8 | - |
|  | Total PAHs | 13 | 7.17×10-8 | 6.08×10-9 | 4.08×10-7 | 1.1×10-7 |
|  | Ace | 3 | 1.03×10-8 | 1.48×10-9 | 2.03×10-8 | 9.44×10-9 |
|  | Flr | 8 | 6.56×10-9 | 1.15×10-9 | 2.82×10-8 | 9.62×10-9 |
|  | Ant | 10 | 7.36×10-9 | 2.16×10-9 | 3.34×10-8 | 1.01×10-8 |
|  | Flt | 10 | 5.09×10-9 | 1.49×10-9 | 3.07×10-8 | 9.03×10-9 |
|  | Pyr | 9 | 6.03×10-9 | 1.28×10-9 | 2.87×10-8 | 9.21×10-9 |
|  | B[a]A | 5 | 1.24×10-8 | 4.33×10-9 | 3.02×10-8 | 1.03×10-8 |
| Children | Chr | 7 | 6.55×10-9 | 3.72×10-9 | 9.12×10-9 | 1.77×10-9 |
|  | B[b]F | 12 | 9.58×10-9 | 4.67×10-9 | 1.20×10-8 | 2.14×10-9 |
|  | B[k]F | 5 | 1.18×10-8 | 9.02×10-9 | 1.33×10-8 | 1.65×10-9 |
|  | B[a]P | 4 | 1.28×10-8 | 6.75×10-9 | 1.84×10-8 | 4.78×10-9 |
|  | I[c]P | 2 | 2.99×10-8 | 2.56×10-8 | 3.42×10-8 | 6.09×10-9 |
|  | B[h]A | 1 | 3.80×10-8 | 3.80×10-8 | 3.80×10-8 | - |
|  | B[g]P | 1 | 2.26×10-8 | 2.26×10-8 | 2.26×10-8 | - |
|  | Total PAHs | 13 | 5.51×10-8 | 4.67×10-9 | 3.14×10-7 | 8.47×10-8 |
|  | Ace | 3 | 1.11×10-8 | 1.59×10-9 | 2.18×10-8 | 1.01×10-8 |
|  | Flr | 8 | 7.05×10-9 | 1.23×10-9 | 3.02×10-8 | 1.03×10-8 |
|  | Ant | 10 | 7.90×10-9 | 2.32×10-9 | 3.59×10-8 | 1.08×10-8 |
|  | Flt | 10 | 5.46×10-9 | 1.60×10-9 | 3.29×10-8 | 9.70×10-9 |
|  | Pyr | 9 | 6.48×10-9 | 1.38×10-9 | 3.08×10-8 | 9.89×10-9 |
|  | B[a]A | 5 | 1.34×10-8 | 4.65×10-9 | 3.25×10-8 | 1.11×10-8 |
| Adolescent | Chr | 7 | 7.04×10-9 | 3.99×10-9 | 9.80×10-9 | 1.90×10-9 |
|  | B[b]F | 12 | 1.03×10-8 | 5.02×10-9 | 1.29×10-8 | 2.30×10-9 |
|  | B[k]F | 5 | 1.27×10-8 | 9.69×10-9 | 1.43×10-8 | 1.77×10-9 |
|  | B[a]P | 4 | 1.38×10-8 | 7.25×10-9 | 1.98×10-8 | 5.13×10-9 |
|  | I[c]P | 2 | 3.21×10-8 | 2.75×10-8 | 3.68×10-8 | 6.55×10-9 |
|  | B[h]A | 1 | 4.08×10-8 | 4.08×10-8 | 4.08×10-8 | - |
|  | B[g]P | 1 | 2.43×10-8 | 2.43×10-8 | 2.43×10-8 | - |
|  | Total PAHs | 13 | 5.92×10-8 | 5.02×10-9 | 3.37×10-7 | 9.10×10-8 |
|  | Ace | 3 | 2.41×10-8 | 3.45×10-9 | 4.73×10-8 | 2.20×10-8 |
|  | Flr | 8 | 1.53×10-8 | 2.68×10-9 | 6.57×10-8 | 2.24×10-8 |
|  | Ant | 10 | 1.72×10-8 | 5.03×10-9 | 7.79×10-8 | 2.35×10-8 |
|  | Flt | 10 | 1.19×10-8 | 3.48×10-9 | 7.15×10-8 | 2.11×10-8 |
|  | Pyr | 9 | 1.41×10-8 | 2.99×10-9 | 6.70×10-8 | 2.15×10-8 |
|  | B[a]A | 5 | 2.90×10-8 | 1.01×10-8 | 7.05×10-8 | 2.40×10-8 |
| Adult | Chr | 7 | 1.53×10-8 | 8.67×10-9 | 2.13×10-8 | 4.13×10-9 |
|  | B[b]F | 12 | 2.24×10-8 | 1.09×10-8 | 2.80×10-8 | 5.00×10-9 |
|  | B[k]F | 5 | 2.76×10-8 | 2.10×10-8 | 3.10×10-8 | 3.84×10-9 |
|  | B[a]P | 4 | 2.99×10-8 | 1.57×10-8 | 4.29×10-8 | 1.11×10-8 |
|  | I[c]P | 2 | 6.98×10-8 | 5.97×10-8 | 7.98×10-8 | 1.42×10-8 |
|  | B[h]A | 1 | 8.86×10-8 | 8.86×10-8 | 8.86×10-8 | - |
|  | B[g]P | 1 | 5.27×10-8 | 5.27×10-8 | 5.27×10-8 | - |
|  | Total PAHs | 13 | 1.29×10-7 | 1.09×10-8 | 7.33×10-7 | 1.98×10-7 |

**Table S10:** Statistical table for LADD for every category of group age for non-cancer risk.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group Age | Variable | N | Mean | Min | Max | Stdev |
|  | Ace | 3 | 2.52×10-7 | 3.61×10-8 | 4.94×10-7 | 2.30×10-7 |
|  | Flr | 8 | 1.60×10-7 | 2.80×10-8 | 6.87×10-7 | 2.35×10-7 |
|  | Ant | 10 | 1.79×10-7 | 5.26×10-8 | 8.15×10-7 | 2.46×10-7 |
|  | Flt | 10 | 1.24×10-7 | 3.64×10-8 | 7.48×10-7 | 2.20×10-7 |
|  | Pyr | 9 | 1.47×10-7 | 3.13×10-8 | 7.01×10-7 | 2.25×10-7 |
|  | B[a]A | 5 | 3.04×10-7 | 1.06×10-7 | 7.38×10-7 | 2.51×10-7 |
| Infant | Chr | 7 | 1.60×10-7 | 9.07×10-8 | 2.23×10-7 | 4.32×10-8 |
|  | B[b]F | 12 | 2.34×10-7 | 1.14×10-7 | 2.93×10-7 | 5.23×10-8 |
|  | B[k]F | 5 | 2.89×10-7 | 2.20×10-7 | 3.24×10-7 | 4.02×10-8 |
|  | B[a]P | 4 | 3.13×10-7 | 1.65×10-7 | 4.49×10-7 | 1.17×10-7 |
|  | I[c]P | 2 | 7.30×10-7 | 6.25×10-7 | 8.35×10-7 | 1.49×10-7 |
|  | B[h]A | 1 | 9.27×10-7 | 9.27×10-7 | 9.27×10-7 | - |
|  | B[g]P | 1 | 5.51×10-7 | 5.51×10-7 | 5.51×10-7 | - |
|  | Total PAHs | 13 | 1.34×10-6 | 1.14×10-7 | 7.67×10-6 | 2.07×10-6 |
|  | Ace | 3 | 1.96×10-7 | 2.80×10-8 | 3.85×10-7 | 1.79×10-7 |
|  | Flr | 8 | 1.25×10-7 | 2.18×10-8 | 5.34×10-7 | 1.83×10-7 |
|  | Ant | 10 | 1.40×10-7 | 4.09×10-8 | 6.34×10-7 | 1.91×10-7 |
|  | Flt | 10 | 9.65×10-8 | 2.83×10-8 | 5.82×10-7 | 1.71×10-7 |
|  | Pyr | 9 | 1.14×10-7 | 2.43×10-8 | 5.45×10-7 | 1.75×10-7 |
| Toddler | B[a]A | 5 | 2.36×10-7 | 8.22×10-8 | 5.74×10-7 | 1.96×10-7 |
|  | Chr | 7 | 1.24×10-7 | 7.06×10-8 | 1.73×10-7 | 3.36×10-8 |
|  | B[b]F | 12 | 1.82×10-7 | 8.87×10-8 | 2.28×10-7 | 4.06×10-8 |
|  | B[k]F | 5 | 2.25×10-7 | 1.71×10-7 | 2.52×10-7 | 3.12×10-8 |
|  | B[a]P | 4 | 2.43×10-7 | 1.28×10-7 | 3.49×10-7 | 9.07×10-8 |
|  | I[c]P | 2 | 5.68×10-7 | 4.86×10-7 | 6.50×10-7 | 1.16×10-7 |
|  | B[h]A | 1 | 7.21×10-7 | 7.21×10-7 | 7.21×10-7 | - |
|  | B[g]P | 1 | 4.29×10-7 | 4.29×10-7 | 4.29×10-7 | - |
|  | Total PAHs | 13 | 1.05×10-6 | 8.87×10-8 | 5.96×10-6 | 1.61×10-6 |
|  | Ace | 3 | 1.26×10-7 | 1.80×10-8 | 2.47×10-7 | 1.15×10-7 |
|  | Flr | 8 | 7.98×10-8 | 1.40×10-8 | 3.43×10-7 | 1.17×10-7 |
|  | Ant | 10 | 8.95×10-8 | 2.62×10-8 | 4.06×10-7 | 1.22×10-7 |
|  | Flt | 10 | 6.19×10-8 | 1.81×10-8 | 3.73×10-7 | 1.10×10-7 |
|  | Pyr | 9 | 7.34×10-8 | 1.56×10-8 | 3.49×10-7 | 1.12×10-7 |
|  | B[a]A | 5 | 1.51×10-7 | 5.27×10-8 | 3.68×10-7 | 1.25×10-7 |
| Children | Chr | 7 | 7.97×10-8 | 4.52×10-8 | 1.11×10-7 | 2.15×10-8 |
|  | B[b]F | 12 | 1.17×10-7 | 5.69×10-8 | 1.46×10-7 | 2.61×10-8 |
|  | B[k]F | 5 | 1.44×10-7 | 1.10×10-7 | 1.62×10-7 | 2.00×10-8 |
|  | B[a]P | 4 | 1.56×10-7 | 8.21×10-8 | 2.24×10-7 | 5.81×10-8 |
|  | I[c]P | 2 | 3.64×10-7 | 3.12×10-7 | 4.16×10-7 | 7.41×10-8 |
|  | B[h]A | 1 | 4.62×10-7 | 4.62×10-7 | 4.62×10-7 | - |
|  | B[g]P | 1 | 2.75×10-7 | 2.75×10-7 | 2.75×10-7 | - |
|  | Total PAHs | 13 | 6.70×10-7 | 5.69×10-8 | 3.82×10-6 | 1.03×10-6 |
|  | Ace | 3 | 1.35×10-7 | 1.93×10-8 | 2.65×10-7 | 1.23×10-7 |
|  | Flr | 8 | 8.58×10-8 | 1.50×10-8 | 3.68×10-7 | 1.26×10-7 |
|  | Ant | 10 | 9.61×10-8 | 2.82×10-8 | 4.36×10-7 | 1.31×10-7 |
|  | Flt | 10 | 6.65×10-8 | 1.95×10-8 | 4.01×10-7 | 1.18×10-7 |
|  | Pyr | 9 | 7.88×10-8 | 1.67×10-8 | 3.75×10-7 | 1.20×10-7 |
|  | B[a]A | 5 | 1.63×10-7 | 5.66×10-8 | 3.95×10-7 | 1.35×10-7 |
| Adolescent | Chr | 7 | 8.56×10-8 | 4.86×10-8 | 1.19×10-7 | 2.31×10-8 |
|  | B[b]F | 12 | 1.25×10-7 | 6.11×10-8 | 1.57×10-7 | 2.80×10-8 |
|  | B[k]F | 5 | 1.55×10-7 | 1.18×10-7 | 1.73×10-7 | 2.15×10-8 |
|  | B[a]P | 4 | 1.68×10-7 | 8.82×10-8 | 2.41×10-7 | 6.24×10-8 |
|  | I[c]P | 2 | 3.91×10-7 | 3.35×10-7 | 4.47×10-7 | 7.97×10-8 |
|  | B[h]A | 1 | 4.96×10-7 | 4.96×10-7 | 4.96×10-7 | - |
|  | B[g]P | 1 | 2.95×10-7 | 2.95×10-7 | 2.95×10-7 | - |
|  | Total PAHs | 13 | 7.20×10-7 | 6.11×10-8 | 4.11×10-6 | 1.11×10-6 |
|  | Ace | 3 | 7.33×10-8 | 1.05×10-8 | 1.44×10-7 | 6.70×10-8 |
|  | Flr | 8 | 4.66×10-8 | 8.15×10-9 | 2.00×10-7 | 6.82×10-8 |
|  | Ant | 10 | 5.22×10-8 | 1.53×10-8 | 2.37×10-7 | 7.14×10-8 |
|  | Flt | 10 | 3.61×10-8 | 1.06×10-8 | 2.18×10-7 | 6.41×10-8 |
|  | Pyr | 9 | 4.28×10-8 | 9.09×10-9 | 2.04×10-7 | 6.53×10-8 |
|  | B[a]A | 5 | 8.83×10-8 | 3.07×10-8 | 2.15×10-7 | 7.31×10-8 |
| Adult | Chr | 7 | 4.65×10-8 | 2.64×10-8 | 6.47×10-8 | 1.26×10-8 |
|  | B[b]F | 12 | 6.80×10-8 | 3.32×10-8 | 8.51×10-8 | 1.52×10-8 |
|  | B[k]F | 5 | 8.40×10-8 | 6.40×10-8 | 9.42×10-8 | 1.17×10-8 |
|  | B[a]P | 4 | 9.10×10-8 | 4.79×10-8 | 1.31×10-7 | 3.39×10-8 |
|  | I[c]P | 2 | 2.12×10-7 | 1.82×10-7 | 2.43×10-7 | 4.32×10-8 |
|  | B[h]A | 1 | 2.69×10-7 | 2.69×10-7 | 2.69×10-7 | - |
|  | B[g]P | 1 | 1.60×10-7 | 1.60×10-7 | 1.60×10-7 | - |
|  | Total PAHs | 13 | 3.91×10-7 | 3.32×10-8 | 2.23×10-6 | 6.01×10-7 |

**Table S11:** Statistical summary for **a)** Overall excess lifetime cancer risk (ELCR) and **b)** ELCR for each sampling site for every category of age group

**a)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group | Compound | N | Mean | Min | Max | Std×10v. |
| Infant | Ace | 3 | 4.93×10-15 | 7.04×10-16 | 9.66×10-15 | 4.50×10-15 |
|  | Flr | 8 | 3.13×10-15 | 5.48×10-16 | 1.34×10-14 | 4.58×10-15 |
|  | Ant | 10 | 3.51×10-14 | 1.03×10-14 | 1.59×10-13 | 4.80×10-14 |
|  | Flt | 10 | 2.42×10-15 | 7.10×10-16 | 1.46×10-14 | 4.31×10-15 |
|  | Pyr | 9 | 2.87×10-15 | 6.11×10-16 | 1.37×10-14 | 4.39×10-15 |
|  | B[a]A | 5 | 5.93×10-13 | 2.06×10-13 | 1.44×10-12 | 4.91×10-13 |
|  | Chr | 7 | 3.12×10-14 | 1.77×10-14 | 4.35×10-14 | 8.44×10-15 |
|  | B[b]F | 12 | 4.57×10-13 | 2.23×10-13 | 5.71×10-13 | 1.02×10-13 |
|  | B[k]F | 5 | 5.65×10-13 | 4.30×10-13 | 6.33×10-13 | 7.85×10-14 |
|  | B[a]P | 4 | 6.11×10-12 | 3.22×10-12 | 8.78×10-12 | 2.28×10-12 |
|  | I[c]P | 2 | 1.43×10-12 | 1.22×10-12 | 1.63×10-12 | 2.90×10-13 |
|  | B[h]A | 1 | 1.97×10-11 | 1.97×10-11 | 1.97×10-11 | - |
|  | B[g]P | 1 | 1.08×10-13 | 1.08×10-13 | 1.08×10-13 | - |
| Toddler | Ace | 3 | 2.46×10-14 | 3.52×10-15 | 4.83×10-14 | 2.25×10-14 |
|  | Flr | 8 | 1.56×10-14 | 2.74×10-15 | 6.71×10-14 | 2.29×10-14 |
|  | Ant | 10 | 1.75×10-13 | 5.14×10-14 | 7.96×10-13 | 2.40×10-13 |
|  | Flt | 10 | 1.21×10-14 | 3.55×10-15 | 7.31×10-14 | 2.15×10-14 |
|  | Pyr | 9 | 1.44×10-14 | 3.05×10-15 | 6.84×10-14 | 2.19×10-14 |
|  | B[a]A | 5 | 2.97×10-12 | 1.03×10-12 | 7.21×10-12 | 2.46×10-12 |
|  | Chr | 7 | 1.56×10-13 | 8.86×10-14 | 2.17×10-13 | 4.22×10-14 |
|  | B[b]F | 12 | 2.28×10-12 | 1.11×10-12 | 2.86×10-12 | 5.10×10-13 |
|  | B[k]F | 5 | 2.82×10-12 | 2.15×10-12 | 3.16×10-12 | 3.92×10-13 |
|  | B[a]P | 4 | 3.06×10-11 | 1.61×10-11 | 4.39×10-11 | 1.14×10-11 |
|  | I[c]P | 2 | 7.13×10-12 | 6.10×10-12 | 8.16×10-12 | 1.45×10-12 |
|  | B[h]A | 1 | 9.87×10-11 | 9.87×10-11 | 9.87×10-11 | - |
|  | B[g]P | 1 | 5.38×10-13 | 5.38×10-13 | 5.38×10-13 | - |
| Children | Ace | 3 | 2.96×10-14 | 4.23×10-15 | 5.80×10-14 | 2.70×10-14 |
|  | Flr | 8 | 1.88×10-14 | 3.29×10-15 | 8.05×10-14 | 2.75×10-14 |
|  | Ant | 10 | 2.10×10-13 | 6.17×10-14 | 9.55×10-13 | 2.88×10-13 |
|  | Flt | 10 | 1.45×10-14 | 4.26×10-15 | 8.77×10-14 | 2.58×10-14 |
|  | Pyr | 9 | 1.72×10-14 | 3.66×10-15 | 8.21×10-14 | 2.63×10-14 |
|  | B[a]A | 5 | 3.56×10-12 | 1.24×10-12 | 8.65×10-12 | 2.95×10-12 |
|  | Chr | 7 | 1.87×10-13 | 1.06×10-13 | 2.61×10-13 | 5.07×10-14 |
|  | B[b]F | 12 | 2.74×10-12 | 1.34×10-12 | 3.43×10-12 | 6.12×10-13 |
|  | B[k]F | 5 | 3.39×10-12 | 2.58×10-12 | 3.80×10-12 | 4.71×10-13 |
|  | B[a]P | 4 | 3.67×10-11 | 1.93×10-11 | 5.27×10-11 | 1.37×10-11 |
|  | I[c]P | 2 | 8.56×10-12 | 7.32×10-12 | 9.79×10-12 | 1.74×10-12 |
|  | B[h]A | 1 | 1.18×10-10 | 1.18×10-10 | 1.18×10-10 | - |
|  | B[g]P | 1 | 6.46×10-13 | 6.46×10-13 | 6.46×10-13 | - |
| Adolescent | Ace | 3 | 2.96×10-14 | 4.23×10-15 | 5.80×10-14 | 2.70×10-14 |
|  | Flr | 8 | 1.88×10-14 | 3.29×10-15 | 8.05×10-14 | 2.75×10-14 |
|  | Ant | 10 | 2.10×10-13 | 6.17×10-14 | 9.55×10-13 | 2.88×10-13 |
|  | Flt | 10 | 1.45×10-14 | 4.26×10-15 | 8.77×10-14 | 2.58×10-14 |
|  | Pyr | 9 | 1.72×10-14 | 3.66×10-15 | 8.21×10-14 | 2.63×10-14 |
|  | B[a]A | 5 | 3.56×10-12 | 1.24×10-12 | 8.65×10-12 | 2.95×10-12 |
|  | Chr | 7 | 1.87×10-13 | 1.06×10-13 | 2.61×10-13 | 5.07×10-14 |
|  | B[b]F | 12 | 2.74×10-12 | 1.34×10-12 | 3.43×10-12 | 6.12×10-13 |
|  | B[k]F | 5 | 3.39×10-12 | 2.58×10-12 | 3.80×10-12 | 4.71×10-13 |
|  | B[a]P | 4 | 3.67×10-11 | 1.93×10-11 | 5.27×10-11 | 1.37×10-11 |
|  | I[c]P | 2 | 8.56×10-12 | 7.32×10-12 | 9.79×10-12 | 1.74×10-12 |
|  | B[h]A | 1 | 1.18×10-10 | 1.18×10-10 | 1.18×10-10 | - |
|  | B[g]P | 1 | 6.46×10-13 | 6.46×10-13 | 6.46×10-13 | - |
| Adult | Ace | 3 | 1.18×10-13 | 1.69×10-14 | 2.32×10-13 | 1.08×10-13 |
|  | Flr | 8 | 7.51×10-14 | 1.31×10-14 | 3.22×10-13 | 1.10×10-13 |
|  | Ant | 10 | 8.41×10-13 | 2.47×10-13 | 3.82×10-12 | 1.15×10-12 |
|  | Flt | 10 | 5.82×10-14 | 1.70×10-14 | 3.51×10-13 | 1.03×10-13 |
|  | Pyr | 9 | 6.90×10-14 | 1.47×10-14 | 3.28×10-13 | 1.05×10-13 |
|  | B[a]A | 5 | 1.42×10-11 | 4.96×10-12 | 3.46×10-11 | 1.18×10-11 |
|  | Chr | 7 | 7.49×10-13 | 4.25×10-13 | 1.04×10-12 | 2.03×10-13 |
|  | B[b]F | 12 | 1.10×10-11 | 5.35×10-12 | 1.37×10-11 | 2.45×10-12 |
|  | B[k]F | 5 | 1.36×10-11 | 1.03×10-11 | 1.52×10-11 | 1.88×10-12 |
|  | B[a]P | 4 | 1.47×10-10 | 7.72×10-11 | 2.11×10-10 | 5.46×10-11 |
|  | I[c]P | 2 | 3.42×10-11 | 2.93×10-11 | 3.92×10-11 | 6.97×10-12 |
|  | B[h]A | 1 | 4.74×10-10 | 4.74×10-10 | 4.74×10-10 | - |
|  | B[g]P | 1 | 2.58×10-12 | 2.58×10-12 | 2.58×10-12 | - |

**b)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Group | Sampling site | PAHs | N | Mean | Min | Max | Stdev |
| Infant | DBKL | Flr | 1 | 9.69×10-16 | 9.69×10-16 | 9.69×10-16 | - |
|  |  | Ant | 2 | 1.75×10-14 | 1.13×10-14 | 2.37×10-14 | 8.82×10-15 |
|  |  | Flt | 2 | 1.33×10-15 | 8.69×10-16 | 1.80×10-15 | 6.56×10-16 |
|  |  | Pyr | 2 | 9.39×10-16 | 6.75×10-16 | 1.20×10-15 | 3.73×10-16 |
|  |  | B[a]A | 1 | 3.59×10-13 | 3.59×10-13 | 3.59×10-13 | - |
|  |  | Chr | 1 | 3.64×10-14 | 3.64×10-14 | 3.64×10-14 | - |
|  |  | B[b]F | 3 | 5.12×10-13 | 4.51×10-13 | 5.71×10-13 | 6.03×10-14 |
|  |  | B[k]F | 1 | 6.33×10-13 | 6.33×10-13 | 6.33×10-13 | - |
|  | Wisma | Flr | 2 | 9.29×10-16 | 7.99×10-16 | 1.06×10-15 | 1.84×10-16 |
|  |  | Ant | 4 | 1.40×10-14 | 1.07×10-14 | 2.32×10-14 | 6.12×10-15 |
|  |  | Flt | 4 | 1.08×10-15 | 7.23×10-16 | 1.95×10-15 | 5.84×10-16 |
|  |  | Pyr | 3 | 9.02×10-16 | 6.30×10-16 | 1.38×10-15 | 4.14×10-16 |
|  |  | B[a]A | 1 | 3.95×10-13 | 3.95×10-13 | 3.95×10-13 | - |
|  |  | Chr | 1 | 3.30×10-14 | 3.30×10-14 | 3.30×10-14 | - |
|  |  | B[b]F | 3 | 5.19×10-13 | 4.77×10-13 | 5.51×10-13 | 3.76×10-14 |
|  |  | B[k]F | 1 | 6.02×10-13 | 6.02×10-13 | 6.02×10-13 | - |
|  |  | B[a]P | 1 | 6.08×10-12 | 6.08×10-12 | 6.08×10-12 | - |
|  | KKKL | Ace | 3 | 4.93×10-15 | 7.04×10-16 | 9.66×10-15 | 4.50×10-15 |
|  |  | Flr | 5 | 4.44×10-15 | 5.48×10-16 | 1.34×10-14 | 5.57×10-15 |
|  |  | Ant | 4 | 6.49×10-14 | 1.03×10-14 | 1.59×10-13 | 6.97×10-14 |
|  |  | Flt | 4 | 4.32×10-15 | 7.10×10-16 | 1.46×10-14 | 6.87×10-15 |
|  |  | Pyr | 4 | 5.32×10-15 | 6.11×10-16 | 1.37×10-14 | 6.07×10-15 |
|  |  | B[a]A | 3 | 7.38×10-13 | 2.06×10-13 | 1.44×10-12 | 6.35×10-13 |
|  |  | Chr | 5 | 2.98×10-14 | 1.77×10-14 | 4.35×10-14 | 9.85×10-15 |
|  |  | B[b]F | 6 | 3.98×10-13 | 2.23×10-13 | 5.02×10-13 | 1.13×10-13 |
|  |  | B[k]F | 3 | 5.29×10-13 | 4.30×10-13 | 5.82×10-13 | 8.61×10-14 |
|  |  | B[a]P | 3 | 6.12×10-12 | 3.22×10-12 | 8.78×10-12 | 2.79×10-12 |
|  |  | I[c]P | 2 | 1.43×10-12 | 1.22×10-12 | 1.63×10-12 | 2.90×10-13 |
|  |  | B[h]A | 1 | 1.97×10-11 | 1.97×10-11 | 1.97×10-11 | - |
|  |  | B[g]P | 1 | 1.08×10-13 | 1.08×10-13 | 1.08×10-13 | - |
| Toddler | DBKL | Flr | 1 | 4.85×10-15 | 4.85×10-15 | 4.85×10-15 | - |
|  |  | Ant | 2 | 8.75×10-14 | 5.63×10-14 | 1.19×10-13 | 4.41×10-14 |
|  |  | Flt | 2 | 6.66×10-15 | 4.35×10-15 | 8.98×10-15 | 3.28×10-15 |
|  |  | Pyr | 2 | 4.69×10-15 | 3.37×10-15 | 6.01×10-15 | 1.87×10-15 |
|  |  | B[a]A | 1 | 1.80×10-12 | 1.80×10-12 | 1.80×10-12 | - |
|  |  | Chr | 1 | 1.82×10-13 | 1.82×10-13 | 1.82×10-13 | - |
|  |  | B[b]F | 3 | 2.56×10-12 | 2.25×10-12 | 2.86×10-12 | 3.02×10-13 |
|  |  | B[k]F | 1 | 3.16×10-12 | 3.16×10-12 | 3.16×10-12 | - |
|  | Wisma | Flr | 2 | 4.65×10-15 | 4.00×10-15 | 5.30×10-15 | 9.19×10-16 |
|  |  | Ant | 4 | 7.01×10-14 | 5.35×10-14 | 1.16×10-13 | 3.06×10-14 |
|  |  | Flt | 4 | 5.40×10-15 | 3.61×10-15 | 9.76×10-15 | 2.92×10-15 |
|  |  | Pyr | 3 | 4.51×10-15 | 3.15×10-15 | 6.89×10-15 | 2.07×10-15 |
|  |  | B[a]A | 1 | 1.97×10-12 | 1.97×10-12 | 1.97×10-12 | - |
|  |  | Chr | 1 | 1.65×10-13 | 1.65×10-13 | 1.65×10-13 | - |
|  |  | B[b]F | 3 | 2.59×10-12 | 2.39×10-12 | 2.75×10-12 | 1.88×10-13 |
|  |  | B[k]F | 1 | 3.01×10-12 | 3.01×10-12 | 3.01×10-12 | - |
|  |  | B[a]P | 1 | 3.04×10-11 | 3.04×10-11 | 3.04×10-11 | - |
|  | KKKL | Ace | 3 | 2.46×10-14 | 3.52×10-15 | 4.83×10-14 | 2.25×10-14 |
|  |  | Flr | 5 | 2.22×10-14 | 2.74×10-15 | 6.71×10-14 | 2.79×10-14 |
|  |  | Ant | 4 | 3.24×10-13 | 5.14×10-14 | 7.96×10-13 | 3.48×10-13 |
|  |  | Flt | 4 | 2.16×10-14 | 3.55×10-15 | 7.31×10-14 | 3.43×10-14 |
|  |  | Pyr | 4 | 2.66×10-14 | 3.05×10-15 | 6.84×10-14 | 3.03×10-14 |
|  |  | B[a]A | 3 | 3.69×10-12 | 1.03×10-12 | 7.21×10-12 | 3.18×10-12 |
|  |  | Chr | 5 | 1.49×10-13 | 8.86×10-14 | 2.17×10-13 | 4.92×10-14 |
|  |  | B[b]F | 6 | 1.99×10-12 | 1.11×10-12 | 2.51×10-12 | 5.63×10-13 |
|  |  | B[k]F | 3 | 2.65×10-12 | 2.15×10-12 | 2.91×10-12 | 4.30×10-13 |
|  |  | B[a]P | 3 | 3.06×10-11 | 1.61×10-11 | 4.39×10-11 | 1.39×10-11 |
|  |  | I[c]P | 2 | 7.13×10-12 | 6.10×10-12 | 8.16×10-12 | 1.45×10-12 |
|  |  | B[h]A | 1 | 9.87×10-11 | 9.87×10-11 | 9.87×10-11 | - |
|  |  | B[g]P | 1 | 5.38×10-13 | 5.38×10-13 | 5.38×10-13 | - |
| Children | DBKL | Flr | 1 | 5.81×10-15 | 5.81×10-15 | 5.81×10-15 | - |
|  |  | Ant | 2 | 1.05×10-13 | 6.76×10-14 | 1.42×10-13 | 5.29×10-14 |
|  |  | Flt | 2 | 8.00×10-15 | 5.21×10-15 | 1.08×10-14 | 3.94×10-15 |
|  |  | Pyr | 2 | 5.63×10-15 | 4.05×10-15 | 7.22×10-15 | 2.24×10-15 |
|  |  | B[a]A | 1 | 2.15×10-12 | 2.15×10-12 | 2.15×10-12 | - |
|  |  | Chr | 1 | 2.18×10-13 | 2.18×10-13 | 2.18×10-13 | - |
|  |  | B[b]F | 3 | 3.07×10-12 | 2.70×10-12 | 3.43×10-12 | 3.62×10-13 |
|  |  | B[k]F | 1 | 3.80×10-12 | 3.80×10-12 | 3.80×10-12 | - |
|  | Wisma | Flr | 2 | 5.58×10-15 | 4.80×10-15 | 6.36×10-15 | 1.10×10-15 |
|  |  | Ant | 4 | 8.42×10-14 | 6.42×10-14 | 1.39×10-13 | 3.67×10-14 |
|  |  | Flt | 4 | 6.48×10-15 | 4.34×10-15 | 1.17×10-14 | 3.50×10-15 |
|  |  | Pyr | 3 | 5.41×10-15 | 3.78×10-15 | 8.27×10-15 | 2.48×10-15 |
|  |  | B[a]A | 1 | 2.37×10-12 | 2.37×10-12 | 2.37×10-12 | - |
|  |  | Chr | 1 | 1.98×10-13 | 1.98×10-13 | 1.98×10-13 | - |
|  |  | B[b]F | 3 | 3.11×10-12 | 2.86×10-12 | 3.31×10-12 | 2.26×10-13 |
|  |  | B[k]F | 1 | 3.61×10-12 | 3.61×10-12 | 3.61×10-12 | - |
|  |  | B[a]P | 1 | 3.65×10-11 | 3.65×10-11 | 3.65×10-11 | - |
|  | KKKL | Ace | 3 | 2.96×10-14 | 4.23×10-15 | 5.80×10-14 | 2.70×10-14 |
|  |  | Flr | 5 | 2.66×10-14 | 3.29×10-15 | 8.05×10-14 | 3.34×10-14 |
|  |  | Ant | 4 | 3.89×10-13 | 6.17×10-14 | 9.55×10-13 | 4.18×10-13 |
|  |  | Flt | 4 | 2.59×10-14 | 4.26×10-15 | 8.77×10-14 | 4.12×10-14 |
|  |  | Pyr | 4 | 3.19×10-14 | 3.66×10-15 | 8.21×10-14 | 3.64×10-14 |
|  |  | B[a]A | 3 | 4.43×10-12 | 1.24×10-12 | 8.65×10-12 | 3.81×10-12 |
|  |  | Chr | 5 | 1.79×10-13 | 1.06×10-13 | 2.61×10-13 | 5.91×10-14 |
|  |  | B[b]F | 6 | 2.39×10-12 | 1.34×10-12 | 3.01×10-12 | 6.75×10-13 |
|  |  | B[k]F | 3 | 3.18×10-12 | 2.58×10-12 | 3.49×10-12 | 5.17×10-13 |
|  |  | B[a]P | 3 | 3.67×10-11 | 1.93×10-11 | 5.27×10-11 | 1.67×10-11 |
|  |  | I[c]P | 2 | 8.56×10-12 | 7.32×10-12 | 9.79×10-12 | 1.74×10-12 |
|  |  | B[h]A | 1 | 1.18×10-10 | 1.18×10-10 | 1.18×10-10 | - |
|  |  | B[g]P | 1 | 6.46×10-13 | 6.46×10-13 | 6.46×10-13 | - |
| Adolescent | DBKL | Flr | 1 | 5.81×10-15 | 5.81×10-15 | 5.81×10-15 | - |
|  |  | Ant | 2 | 1.05×10-13 | 6.76×10-14 | 1.42×10-13 | 5.29×10-14 |
|  |  | Flt | 2 | 8.00×10-15 | 5.21×10-15 | 1.08×10-14 | 3.94×10-15 |
|  |  | Pyr | 2 | 5.63×10-15 | 4.05×10-15 | 7.22×10-15 | 2.24×10-15 |
|  |  | B[a]A | 1 | 2.15×10-12 | 2.15×10-12 | 2.15×10-12 | - |
|  |  | Chr | 1 | 2.18×10-13 | 2.18×10-13 | 2.18×10-13 | - |
|  |  | B[b]F | 3 | 3.07×10-12 | 2.70×10-12 | 3.43×10-12 | 3.62×10-13 |
|  |  | B[k]F | 1 | 3.80×10-12 | 3.80×10-12 | 3.80×10-12 | - |
|  | Wisma | Flr | 2 | 5.58×10-15 | 4.80×10-15 | 6.36×10-15 | 1.10×10-15 |
|  |  | Ant | 4 | 8.42×10-14 | 6.42×10-14 | 1.39×10-13 | 3.67×10-14 |
|  |  | Flt | 4 | 6.48×10-15 | 4.34×10-15 | 1.17×10-14 | 3.50×10-15 |
|  |  | Pyr | 3 | 5.41×10-15 | 3.78×10-15 | 8.27×10-15 | 2.48×10-15 |
|  |  | B[a]A | 1 | 2.37×10-12 | 2.37×10-12 | 2.37×10-12 | - |
|  |  | Chr | 1 | 1.98×10-13 | 1.98×10-13 | 1.98×10-13 | - |
|  |  | B[b]F | 3 | 3.11×10-12 | 2.86×10-12 | 3.31×10-12 | 2.26×10-13 |
|  |  | B[k]F | 1 | 3.61×10-12 | 3.61×10-12 | 3.61×10-12 | - |
|  |  | B[a]P | 1 | 3.65×10-11 | 3.65×10-11 | 3.65×10-11 | - |
|  | KKKL | Ace | 3 | 2.96×10-14 | 4.23×10-15 | 5.80×10-14 | 2.70×10-14 |
|  |  | Flr | 5 | 2.67×10-14 | 3.29×10-15 | 8.05×10-14 | 3.34×10-14 |
|  |  | Ant | 4 | 3.90×10-13 | 6.62×10-14 | 9.55×10-13 | 4.17×10-13 |
|  |  | Flt | 4 | 2.60×10-14 | 4.58×10-15 | 8.77×10-14 | 4.12×10-14 |
|  |  | Pyr | 4 | 3.20×10-14 | 3.94×10-15 | 8.21×10-14 | 3.63×10-14 |
|  |  | B[a]A | 3 | 4.43×10-12 | 1.24×10-12 | 8.65×10-12 | 3.81×10-12 |
|  |  | Chr | 5 | 1.82×10-13 | 1.06×10-13 | 2.61×10-13 | 5.96×10-14 |
|  |  | B[b]F | 6 | 2.42×10-12 | 1.34×10-12 | 3.01×10-12 | 7.05×10-13 |
|  |  | B[k]F | 3 | 3.18×10-12 | 2.58×10-12 | 3.49×10-12 | 5.17×10-13 |
|  |  | B[a]P | 3 | 3.67×10-11 | 1.93×10-11 | 5.27×10-11 | 1.67×10-11 |
|  |  | I[c]P | 2 | 8.56×10-12 | 7.32×10-12 | 9.79×10-12 | 1.74×10-12 |
|  |  | B[h]A | 1 | 1.18×10-10 | 1.18×10-10 | 1.18×10-10 | - |
|  |  | B[g]P | 1 | 6.46×10-13 | 6.46×10-13 | 6.46×10-13 | - |
| Adult | DBKL | Flr | 1 | 2.33×10-14 | 2.33×10-14 | 2.33×10-14 | - |
|  |  | Ant | 2 | 4.20×10-13 | 2.70×10-13 | 5.70×10-13 | 2.12×10-13 |
|  |  | Flt | 2 | 3.20×10-14 | 2.09×10-14 | 4.31×10-14 | 1.57×10-14 |
|  |  | Pyr | 2 | 2.25×10-14 | 1.62×10-14 | 2.89×10-14 | 8.96×10-15 |
|  |  | B[a]A | 1 | 8.62×10-12 | 8.62×10-12 | 8.62×10-12 | - |
|  |  | Chr | 1 | 8.74×10-13 | 8.74×10-13 | 8.74×10-13 | - |
|  |  | B[b]F | 3 | 1.23×10-11 | 1.08×10-11 | 1.37×10-11 | 1.45×10-12 |
|  |  | B[k]F | 1 | 1.52×10-11 | 1.52×10-11 | 1.52×10-11 | - |
|  | Wisma | Flr | 2 | 2.23×10-14 | 1.92×10-14 | 2.54×10-14 | 4.41×10-15 |
|  |  | Ant | 4 | 3.37×10-13 | 2.57×10-13 | 5.57×10-13 | 1.47×10-13 |
|  |  | Flt | 4 | 2.59×10-14 | 1.73×10-14 | 4.69×10-14 | 1.40×10-14 |
|  |  | Pyr | 3 | 2.16×10-14 | 1.51×10-14 | 3.31×10-14 | 9.92×10-15 |
|  |  | B[a]A | 1 | 9.48×10-12 | 9.48×10-12 | 9.48×10-12 | - |
|  |  | Chr | 1 | 7.92×10-13 | 7.92×10-13 | 7.92×10-13 | - |
|  |  | B[b]F | 3 | 1.25×10-11 | 1.15×10-11 | 1.32×10-11 | 9.03×10-13 |
|  |  | B[k]F | 1 | 1.45×10-11 | 1.45×10-11 | 1.45×10-11 | - |
|  |  | B[a]P | 1 | 1.46×10-10 | 1.46×10-10 | 1.46×10-10 | - |
|  | KKKL | Ace | 3 | 1.18×10-13 | 1.69×10-14 | 2.32×10-13 | 1.08×10-13 |
|  |  | Flr | 5 | 1.07×10-13 | 1.31×10-14 | 3.22×10-13 | 1.34×10-13 |
|  |  | Ant | 4 | 1.56×10-12 | 2.47×10-13 | 3.82×10-12 | 1.67×10-12 |
|  |  | Flt | 4 | 1.04×10-13 | 1.70×10-14 | 3.51×10-13 | 1.65×10-13 |
|  |  | Pyr | 4 | 1.28×10-13 | 1.47×10-14 | 3.28×10-13 | 1.46×10-13 |
|  |  | B[a]A | 3 | 1.77×10-11 | 4.96×10-12 | 3.46×10-11 | 1.53×10-11 |
|  |  | Chr | 5 | 7.16×10-13 | 4.25×10-13 | 1.04×10-12 | 2.36×10-13 |
|  |  | B[b]F | 6 | 9.56×10-12 | 5.35×10-12 | 1.21×10-11 | 2.70×10-12 |
|  |  | B[k]F | 3 | 1.27×10-11 | 1.03×10-11 | 1.40×10-11 | 2.07×10-12 |
|  |  | B[a]P | 3 | 1.47×10-10 | 7.72×10-11 | 2.11×10-10 | 6.69×10-11 |
|  |  | I[c]P | 2 | 3.42×10-11 | 2.93×10-11 | 3.92×10-11 | 6.97×10-12 |
|  |  | B[h]A | 1 | 4.74×10-10 | 4.74×10-10 | 4.74×10-10 | - |
|  |  | B[g]P | 1 | 2.58×10-12 | 2.58×10-12 | 2.58×10-12 | - |

**Table S12:** Statistical table for **a)** Overall hazard quotient (HQ) and **b)** HQ in each sampling sites for different age group.

**a)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Group | Compound | N | Average | Median | Min | Max | Stdev |
|  | Ace | 3 | 4.20×10-6 | 3.77×10-6 | 6.01×10-7 | 8.24×10-6 | 3.84×10-6 |
|  | Flr | 8 | 4.00×10-6 | 1.30×10-6 | 7.01×10-7 | 1.72×10-5 | 5.87×10-6 |
|  | Ant | 10 | 5.98×10-7 | 2.18×10-7 | 1.75×10-7 | 2.72×10-6 | 8.18×10-7 |
| Infant | Flt | 10 | 3.10×10-6 | 1.14×10-6 | 9.09×10-7 | 1.87×10-5 | 5.51×10-6 |
|  | Pyr | 9 | 4.91×10-6 | 1.85×10-6 | 1.04×10-6 | 2.34×10-5 | 7.49×10-6 |
|  | B[a]P | 4 | 1.04×10-3 | 1.06×10-3 | 5.49×10-4 | 1.50×10-3 | 3.89×10-4 |
|  | B[g]P | 1 | 1.84×10-5 | 1.84×10-5 | 1.84×10-5 | 1.84×10-5 | - |
|  | Total PAHs | 11 | 3.92×10-4 | 6.00×10-6 | 1.22×10-6 | 1.59×10-3 | 5.87×10-4 |
|  | Ace | 3 | 3.27×10-6 | 2.93×10-6 | 4.67×10-7 | 6.41×10-6 | 2.99×10-6 |
|  | Flr | 8 | 3.11×10-6 | 1.01×10-6 | 5.45×10-7 | 1.34×10-5 | 4.56×10-6 |
|  | Ant | 10 | 4.65×10-7 | 1.70×10-7 | 1.36×10-7 | 2.11×10-6 | 6.37×10-7 |
| Toddler | Flt | 10 | 2.41×10-6 | 8.83×10-7 | 7.07×10-7 | 1.45×10-5 | 4.29×10-6 |
|  | Pyr | 9 | 3.82×10-6 | 1.44×10-6 | 8.10×10-7 | 1.82×10-5 | 5.82×10-6 |
|  | B[a]P | 4 | 8.11×10-4 | 8.27×10-4 | 4.27×10-4 | 1.16×10-3 | 3.02×10-4 |
|  | B[g]P | 1 | 1.43×10-5 | 1.43×10-5 | 1.43×10-5 | 1.43×10-5 | - |
|  | Total PAHs | 11 | 3.05×10-4 | 4.66×10-6 | 9.51×10-7 | 1.23×10-3 | 4.57×10-4 |
|  | Ace | 3 | 2.10×10-6 | 1.88×10-6 | 3.00×10-7 | 4.11×10-6 | 1.91×10-6 |
|  | Flr | 8 | 2.00×10-6 | 6.47×10-7 | 3.50×10-7 | 8.56×10-6 | 2.93×10-6 |
|  | Ant | 10 | 2.98×10-7 | 1.09×10-7 | 8.74×10-8 | 1.35×10-6 | 4.08×10-7 |
| Children | Flt | 10 | 1.55×10-6 | 5.66×10-7 | 4.53×10-7 | 9.33×10-6 | 2.75×10-6 |
|  | Pyr | 9 | 2.45×10-6 | 9.23×10-7 | 5.20×10-7 | 1.16×10-5 | 3.73×10-6 |
|  | B[a]P | 4 | 5.20×10-4 | 5.30×10-4 | 2.74×10-4 | 7.47×10-4 | 1.94×10-4 |
|  | B[g]P | 1 | 9.16×10-6 | 9.16×10-6 | 9.16×10-6 | 9.16×10-6 | - |
|  | Total PAHs | 11 | 1.96×10-4 | 2.99×10-6 | 6.09×10-7 | 7.91×10-4 | 2.93×10-4 |
|  | Ace | 3 | 2.25×10-6 | 2.02×10-6 | 3.22×10-7 | 4.41×10-6 | 2.06×10-6 |
|  | Flr | 8 | 2.14×10-6 | 6.95×10-7 | 3.75×10-7 | 9.20×10-6 | 3.14×10-6 |
|  | Ant | 10 | 3.20×10-7 | 1.17×10-7 | 9.39×10-8 | 1.45×10-6 | 4.38×10-7 |
| Adolescent | Flt | 10 | 1.66×10-6 | 6.08×10-7 | 4.87×10-7 | 1.00×10-5 | 2.95×10-6 |
|  | Pyr | 9 | 2.63×10-6 | 9.91×10-7 | 5.58×10-7 | 1.25×10-5 | 4.01×10-6 |
|  | B[a]P | 4 | 5.59×10-4 | 5.69×10-4 | 2.94×10-4 | 8.02×10-4 | 2.08×10-4 |
|  | B[g]P | 1 | 9.84×10-6 | 9.84×10-6 | 9.84×10-6 | 9.84×10-6 | - |
|  | Total PAHs | 11 | 2.10×10-4 | 3.21×10-6 | 6.55×10-7 | 8.50×10-4 | 3.14×10-4 |
|  | Ace | 3 | 1.22×10-6 | 1.10×10-6 | 1.75×10-7 | 2.40×10-6 | 1.12×10-6 |
|  | Flr | 8 | 1.16×10-6 | 3.77×10-7 | 2.04×10-7 | 4.99×10-6 | 1.71×10-6 |
|  | Ant | 10 | 1.74×10-7 | 6.34×10-8 | 5.10×10-8 | 7.90×10-7 | 2.38×10-7 |
| Adult | Flt | 10 | 9.02×10-7 | 3.30×10-7 | 2.64×10-7 | 5.44×10-6 | 1.60×10-6 |
|  | Pyr | 9 | 1.43×10-6 | 5.38×10-7 | 3.03×10-7 | 6.79×10-6 | 2.18×10-6 |
|  | B[a]P | 4 | 3.03×10-4 | 3.09×10-4 | 1.60×10-4 | 4.35×10-4 | 1.13×10-4 |
|  | B[g]P | 1 | 5.34×10-6 | 5.34×10-6 | 5.34×10-6 | 5.34×10-6 | - |
|  | Total PAHs | 11 | 1.14×10-4 | 1.74×10-6 | 3.55×10-7 | 4.61×10-4 | 1.71×10-4 |

**b)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Group | Sampling site | Compound | N | Mean | Min | Max | Stdev |
| Infant | DBKL | Flr | 1 | 1.24×10-6 | 1.24×10-6 | 1.24×10-6 | - |
|  |  | Ant | 2 | 2.99×10-7 | 1.92×10-7 | 4.05×10-7 | 1.51×10-7 |
|  |  | Flt | 2 | 1.71×10-6 | 1.11×10-6 | 2.30×10-6 | 8.39×10-7 |
|  |  | Pyr | 2 | 1.60×10-6 | 1.15×10-6 | 2.05×10-6 | 6.37×10-7 |
|  |  | Total PAHs | 2 | 4.23×10-6 | 2.46×10-6 | 6.00×10-6 | 2.50×10-6 |
|  | Wisma | Flr | 2 | 1.19×10-6 | 1.02×10-6 | 1.36×10-6 | 2.35×10-7 |
|  |  | Ant | 4 | 2.39×10-7 | 1.83×10-7 | 3.96×10-7 | 1.04×10-7 |
|  |  | Flt | 4 | 1.38×10-6 | 9.25×10-7 | 2.50×10-6 | 7.48×10-7 |
|  |  | Pyr | 3 | 1.54×10-6 | 1.08×10-6 | 2.35×10-6 | 7.06×10-7 |
|  |  | B[a]P | 1 | 1.04×10-3 | 1.04×10-3 | 1.04×10-3 | - |
|  |  | Total PAHs | 4 | 2.63×10-4 | 1.22×10-6 | 1.04×10-3 | 5.19×10-4 |
|  | KKKL | Ace | 3 | 4.20×10-6 | 6.01×10-7 | 8.24×10-6 | 3.84×10-6 |
|  |  | Flr | 5 | 5.68×10-6 | 7.01×10-7 | 1.72×10-5 | 7.13×10-6 |
|  |  | Ant | 4 | 1.11×10-6 | 1.75×10-7 | 2.72×10-6 | 1.19×10-6 |
|  |  | Flt | 4 | 5.52×10-6 | 9.09×10-7 | 1.87×10-5 | 8.79×10-6 |
|  |  | Pyr | 4 | 9.08×10-6 | 1.04×10-6 | 2.34×10-5 | 1.04×10-5 |
|  |  | B[a]P | 3 | 1.05×10-3 | 5.49×10-4 | 1.50×10-3 | 4.76×10-4 |
|  |  | B[g]P | 1 | 1.84×10-5 | 1.84×10-5 | 1.84×10-5 | - |
|  |  | Total PAHs | 5 | 6.51×10-4 | 1.86×10-6 | 1.59×10-3 | 6.96×10-4 |
| Toddler | DBKL | Flr | 1 | 9.65×10-7 | 9.65×10-7 | 9.65×10-7 | - |
|  |  | Ant | 2 | 2.32×10-7 | 1.50×10-7 | 3.15×10-7 | 1.17×10-7 |
|  |  | Flt | 2 | 1.33×10-6 | 8.65×10-7 | 1.79×10-6 | 6.53×10-7 |
|  |  | Pyr | 2 | 1.25×10-6 | 8.96×10-7 | 1.60×10-6 | 4.95×10-7 |
|  |  | Total PAHs | 2 | 3.29×10-6 | 1.91×10-6 | 4.66×10-6 | 1.95×10-6 |
|  | Wisma | Flr | 2 | 9.25×10-7 | 7.96×10-7 | 1.05×10-6 | 1.83×10-7 |
|  |  | Ant | 4 | 1.86×10-7 | 1.42×10-7 | 3.08×10-7 | 8.12×10-8 |
|  |  | Flt | 4 | 1.07×10-6 | 7.19×10-7 | 1.94×10-6 | 5.81×10-7 |
|  |  | Pyr | 3 | 1.20×10-6 | 8.37×10-7 | 1.83×10-6 | 5.49×10-7 |
|  |  | B[a]P | 1 | 8.07×10-4 | 8.07×10-4 | 8.07×10-4 | - |
|  |  | Total PAHs | 4 | 2.04×10-4 | 9.51×10-7 | 8.09×10-4 | 4.03×10-4 |
|  | KKKL | Ace | 3 | 3.27×10-6 | 4.67×10-7 | 6.41×10-6 | 2.99×10-6 |
|  |  | Flr | 5 | 4.42×10-6 | 5.45×10-7 | 1.34×10-5 | 5.55×10-6 |
|  |  | Ant | 4 | 8.61×10-7 | 1.36×10-7 | 2.11×10-6 | 9.25×10-7 |
|  |  | Flt | 4 | 4.30×10-6 | 7.07×10-7 | 1.45×10-5 | 6.84×10-6 |
|  |  | Pyr | 4 | 7.06×10-6 | 8.10×10-7 | 1.82×10-5 | 8.05×10-6 |
|  |  | B[a]P | 3 | 8.13×10-4 | 4.27×10-4 | 1.16×10-3 | 3.70×10-4 |
|  |  | B[g]P | 1 | 1.43×10-5 | 1.43×10-5 | 1.43×10-5 | - |
|  |  | Total PAHs | 5 | 5.07×10-4 | 1.45×10-6 | 1.23×10-3 | 5.41×10-4 |
| Children | DBKL | Flr | 1 | 6.18×10-7 | 6.18×10-7 | 6.18×10-7 | - |
|  |  | Ant | 2 | 1.49×10-7 | 9.59×10-8 | 2.02×10-7 | 7.51×10-8 |
|  |  | Flt | 2 | 8.50×10-7 | 5.55×10-7 | 1.15×10-6 | 4.19×10-7 |
|  |  | Pyr | 2 | 7.99×10-7 | 5.74×10-7 | 1.02×10-6 | 3.18×10-7 |
|  |  | Total PAHs | 2 | 2.11×10-6 | 1.22×10-6 | 2.99×10-6 | 1.25×10-6 |
|  | Wisma | Flr | 2 | 5.93×10-7 | 5.10×10-7 | 6.76×10-7 | 1.17×10-7 |
|  |  | Ant | 4 | 1.19×10-7 | 9.10×10-8 | 1.97×10-7 | 5.21×10-8 |
|  |  | Flt | 4 | 6.89×10-7 | 4.61×10-7 | 1.25×10-6 | 3.73×10-7 |
|  |  | Pyr | 3 | 7.67×10-7 | 5.36×10-7 | 1.17×10-6 | 3.52×10-7 |
|  |  | B[a]P | 1 | 5.17×10-4 | 5.17×10-4 | 5.17×10-4 | - |
|  |  | Total PAHs | 4 | 1.31×10-4 | 6.09×10-7 | 5.19×10-4 | 2.59×10-4 |
|  | KKKL | Ace | 3 | 2.10×10-6 | 3.00×10-7 | 4.11×10-6 | 1.91×10-6 |
|  |  | Flr | 5 | 2.83×10-6 | 3.50×10-7 | 8.56×10-6 | 3.56×10-6 |
|  |  | Ant | 4 | 5.52×10-7 | 8.74×10-8 | 1.35×10-6 | 5.93×10-7 |
|  |  | Flt | 4 | 2.75×10-6 | 4.53×10-7 | 9.33×10-6 | 4.38×10-6 |
|  |  | Pyr | 4 | 4.53×10-6 | 5.20×10-7 | 1.16×10-5 | 5.16×10-6 |
|  |  | B[a]P | 3 | 5.21×10-4 | 2.74×10-4 | 7.47×10-4 | 2.37×10-4 |
|  |  | B[g]P | 1 | 9.16×10-6 | 9.16×10-6 | 9.16×10-6 | - |
|  |  | Total PAHs | 5 | 3.25×10-4 | 9.27×10-7 | 7.91×10-4 | 3.47×10-4 |
| Adolescent | DBKL | Flr | 1 | 6.64×10-7 | 6.64×10-7 | 6.64×10-7 | - |
|  |  | Ant | 2 | 1.60×10-7 | 1.03×10-7 | 2.17×10-7 | 8.07×10-8 |
|  |  | Flt | 2 | 9.14×10-7 | 5.96×10-7 | 1.23×10-6 | 4.50×10-7 |
|  |  | Pyr | 2 | 8.58×10-7 | 6.17×10-7 | 1.10×10-6 | 3.41×10-7 |
|  |  | Total PAHs | 2 | 2.26×10-6 | 1.32×10-6 | 3.21×10-6 | 1.34×10-6 |
|  | Wisma | Flr | 2 | 6.37×10-7 | 5.48×10-7 | 7.26×10-7 | 1.26×10-7 |
|  |  | Ant | 4 | 1.28×10-7 | 9.78×10-8 | 2.12×10-7 | 5.59×10-8 |
|  |  | Flt | 4 | 7.40×10-7 | 4.95×10-7 | 1.34×10-6 | 4.00×10-7 |
|  |  | Pyr | 3 | 8.24×10-7 | 5.76×10-7 | 1.26×10-6 | 3.78×10-7 |
|  |  | B[a]P | 1 | 5.56×10-4 | 5.56×10-4 | 5.56×10-4 | - |
|  |  | Total PAHs | 4 | 1.41×10-4 | 6.55×10-7 | 5.57×10-4 | 2.78×10-4 |
|  | KKKL | Ace | 3 | 2.25×10-6 | 3.22×10-7 | 4.41×10-6 | 2.06×10-6 |
|  |  | Flr | 5 | 3.04×10-6 | 3.75×10-7 | 9.20×10-6 | 3.82×10-6 |
|  |  | Ant | 4 | 5.93×10-7 | 9.39×10-8 | 1.45×10-6 | 6.37×10-7 |
|  |  | Flt | 4 | 2.96×10-6 | 4.87×10-7 | 1.00×10-5 | 4.71×10-6 |
|  |  | Pyr | 4 | 4.86×10-6 | 5.58×10-7 | 1.25×10-5 | 5.55×10-6 |
|  |  | B[a]P | 3 | 5.60×10-4 | 2.94×10-4 | 8.02×10-4 | 2.55×10-4 |
|  |  | B[g]P | 1 | 9.84×10-6 | 9.84×10-6 | 9.84×10-6 | - |
|  |  | Total PAHs | 5 | 3.49×10-4 | 9.96×10-7 | 8.50×10-4 | 3.73×10-4 |
| Adult | DBKL | Flr | 1 | 3.61×10-7 | 3.61×10-7 | 3.61×10-7 | - |
|  |  | Ant | 2 | 8.69×10-8 | 5.59×10-8 | 1.18×10-7 | 4.38×10-8 |
|  |  | Flt | 2 | 4.96×10-7 | 3.23×10-7 | 6.69×10-7 | 2.44×10-7 |
|  |  | Pyr | 2 | 4.66×10-7 | 3.35×10-7 | 5.97×10-7 | 1.85×10-7 |
|  |  | Total PAHs | 2 | 1.23×10-6 | 7.14×10-7 | 1.74×10-6 | 7.28×10-7 |
|  | Wisma | Flr | 2 | 3.46×10-7 | 2.97×10-7 | 3.94×10-7 | 6.84×10-8 |
|  |  | Ant | 4 | 6.96×10-8 | 5.31×10-8 | 1.15×10-7 | 3.04×10-8 |
|  |  | Flt | 4 | 4.02×10-7 | 2.69×10-7 | 7.27×10-7 | 2.17×10-7 |
|  |  | Pyr | 3 | 4.47×10-7 | 3.13×10-7 | 6.84×10-7 | 2.05×10-7 |
|  |  | B[a]P | 1 | 3.02×10-4 | 3.02×10-4 | 3.02×10-4 | - |
|  |  | Total PAHs | 4 | 7.64×10-5 | 3.55×10-7 | 3.03×10-4 | 1.51×10-4 |
|  | KKKL | Ace | 3 | 1.22×10-6 | 1.75×10-7 | 2.40×10-6 | 1.12×10-6 |
|  |  | Flr | 5 | 1.65×10-6 | 2.04×10-7 | 4.99×10-6 | 2.07×10-6 |
|  |  | Ant | 4 | 3.22×10-7 | 5.10×10-8 | 7.90×10-7 | 3.46×10-7 |
|  |  | Flt | 4 | 1.61×10-6 | 2.64×10-7 | 5.44×10-6 | 2.56×10-6 |
|  |  | Pyr | 4 | 2.64×10-6 | 3.03×10-7 | 6.79×10-6 | 3.01×10-6 |
|  |  | B[a]P | 3 | 3.04×10-4 | 1.60×10-4 | 4.35×10-4 | 1.38×10-4 |
|  |  | B[g]P | 1 | 5.34×10-6 | 5.34×10-6 | 5.34×10-6 | - |
|  |  | Total PAHs | 5 | 1.89×10-4 | 5.41×10-7 | 4.61×10-4 | 2.02×10-4 |

A close up of a map

Description automatically generated

**Sampling sit×10s**

**Figure S1:** Sampling locations of PM2.5 in Kuala Lumpur, Malaysia



**Figure S2:** Temperature (⁰C), relative humidity (RH%) and wind speed (mph) in January to March 2019

**Figure S3:**FTIR spectra recorded between 4000 and 400 cm-1 of MNPs and C8MNPs

**Figure S4:** OC to EC ratios for every filter samples.

A picture containing pencil

Description automatically generated

**Figure S5** a)Concentration of OC1, OC2, OC3, OC4, OP, EC1-OP, EC2 andEC3, b) Concentration of OC, EC and TC and c) Concentration of each PAHs compound and total concentration of PAHs in PM2.5 in Kuala Lumpur

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