# Supplementary materials

**Table S1.** The recoveries of PAHs from the spiking method and SRM-1649 urban dust sample.

| Compound | % Recovery of sample treatment (Mean ± SD) | |
| --- | --- | --- |
| | Spiking method | SRM 1649b |
| | Extraction procedure with SPE clean-up procedure | Extraction procedure with SPE clean-up procedure |
| NAP | 81 ± 1 | 64 ± 2 |
| ACY | 92 ± 3 | 98 ± 3 |
| ACE | 93 ± 9 | 95 ± 5 |
| FLU | 92 ± 5 | 98 ± 9 |
| PHE | 89 ± 3 | 85 ± 3 |
| ANT | 96 ± 2 | 92 ± 6 |
| FLU | 94 ± 4 | 91 ± 5 |
| PYR | 91 ± 1 | 84 ± 2 |

**Table S2.** Analytical characteristics of gaseous PAHs analyzed by GC–MS.

| Compound | Detection limit ($\mu g\ mL^{-1}$) | | Repeatability (% RSD) | | Reproducibility (%RSD) | | Concentration Linearity ($ng\ mL^{-1}$) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | LOD | LOQ | Low range ($6\ ng\ mL^{-1}$) | High range ($60\ ng\ mL^{-1}$) | Low range ($6\ ng\ mL^{-1}$) | High range ($60\ ng\ mL^{-1}$) | |
| NAP | 0.053 | 0.177 | 0.775 | 0.560 | 2.366 | 3.678 | 1-3,000 |
| ACY | 0.039 | 0.129 | 0.589 | 0.462 | 0.901 | 3.419 | 1-3,000 |
| ACE | 0.034 | 0.114 | 0.847 | 0.669 | 1.000 | 3.371 | 1-3,000 |
| FLU | 0.040 | 0.132 | 0.571 | 0.700 | 1.006 | 3.238 | 1-3,000 |
| PHE | 0.032 | 0.107 | 0.575 | 0.703 | 0.685 | 3.366 | 1-3,000 |
| ANT | 0.040 | 0.132 | 0.944 | 0.964 | 0.904 | 3.244 | 1-3,000 |
| FLU | 0.036 | 0.121 | 0.702 | 2.574 | 1.286 | 3.249 | 1-3,000 |
| PYR | 0.038 | 0.126 | 1.477 | 3.488 | 5.003 | 2.351 | 1-3,000 |

**Table S3.** Method detection limit of developed gaseous PAHs sampling device based on   biochar and XAD-2 as adsorbent.

| Compounds | Method detection limit (ng m$^{-3}$) | | | |
| :---: | :---: | :---: | :---: | :---: |
| | Biochar | | XAD-2 | |
| | LOD | LOQ | LOD | LOQ |
| NAP | 4.43 | 14.76 | 1.69 | 5.63 |
| ACY | 0.26 | 0.86 | 0.29 | 0.96 |
| ACE | 0.74 | 2.48 | 1.07 | 3.57 |
| FLU | 0.38 | 1.28 | 0.44 | 1.46 |
| PHE | 0.46 | 1.55 | 0.71 | 2.36 |
| ANT | 1.06 | 3.54 | 0.79 | 2.62 |
| FLU | 0.31 | 1.04 | 0.72 | 2.40 |
| PYR | 0.49 | 1.62 | 0.97 | 3.23 |