**Preliminary assessment of road dust from Portuguese motorways: chemical profile, risks and ecotoxicological screening**

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|  |  |  |
| --- | --- | --- |
| AT | Averaging time | ED \* 365 (non-carc) or ED \* 70 (carc) |
| BW | Body weight | 15 (children) and 70 (adults) kg |
| C | Mass fraction of each element in road dust | X mg kg−1 |
| DA | Dermal absorption factor | 0.001 (unitless) |
| ED | Exposure duration | Non-carcinogenic: 6 years (children), 20 years (adults); carcinogenic: 70 years |
| EF | Exposure frequency | 180 day year-1 |
| IngR | Ingestion rate | 200 (children) and 100 (adults) mg day-1 |
| InhR | Inhalation rate | 7.6 children) and 20 (adults) m3 day-1 |
| PEF | Particle emission factor | 1.36 \*109 m3 kg-1 |
| SA | Exposed skin surface area | 2800 (children) and 5700 (adults) cm2 |
| SAF | Skin adherence factor | 0.2 (children) and 0.07 (adults) mg cm-2 day-1 |

**Table S1.** Description of parameters for the calculation of carcinogenic and non-carcinogenic health risks.

**Table S2.** Reference doses (RfD) and slope factors (SF) for metal(loid)s.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Metal** | **RfDing**  **(mg kg-1 day-1)** | **RfDdermal**  **(mg kg-1 day-1)** | **RfDinh**  **(mg kg-1 day-1)** | **SF**  **(mg kg-1 day-1)** |
| Na | 6.10 x 10-2 | 1.71 x 10-4 | 1.70 x 10-6 |  |
| Mg | 1.81 x 10-1 | 5.06 x 10-4 | 5.05 x 10-6 |  |
| Al | 1.00 × 100 | 1.00 × 10-1 | 1.43 × 10-3 |  |
| Ti | 2.19 x 10-2 | 6.14 x 10-5 | 6.13 x 10-7 |  |
| V | 7.0 × 10-3 | 7.0 × 10-3 | 7.0 × 10-3 |  |
| Cr | 3.00 × 10-3 | 6.00 × 10-5 | 2.86 × 10-5 | 4.20 × 101 |
| Mn | 4.6 × 10-2 | 1.84 × 10-3 | 1.43 × 10-5 |  |
| Fe | 7.0 × 10-1 |  |  |  |
| Ni | 2.00 × 10-2 | 5.40 × 10-3 | 2.06 × 10-2 | 8.40 × 10-1 |
| Cu | 4.00 × 10-2 | 1.20 × 10-2 | 4.02 × 10-2 |  |
| Zn | 3.00 × 10-1 | 6.00 × 10-2 | 3.00 × 10-1 |  |
| Sr | 6.0 × 10-1 | 1.2 × 10-1 |  |  |
| Zr | 2.02 x 10-3 | 5.66 x 10-6 | 5.64 x 10-8 |  |
| Ba | 7.00 × 10-2 | 4.9 × 10-3 | 1.43 × 10-4 |  |
| Pb | 3.50 × 10-3 | 5.25 × 10-4 | 3.52 × 10-3 | 8.50 x 10-3 |

**Table S3.**

Non-carcinogenic (nc) health risk assessment values for adults (AD) and children (CH) for Aveiro – Ílhavo. Exposure routes: ingestion (ing), dermal contact (drm) and inhalation (inh).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | Pathway | Na | Mg | Al | Ti | V | Cr | Mn | Fe | Ni | Cu | Zn | Sr | Zr | Ba | Pb |
| A-29 motorway (SUBURBAN) | HQ ing-nc (CH) | 0.88 | 0.37 | 1.40 | 1.07 | 0.29 | 0.49 | 0.10 | 0.61 | 0.01 | 0.12 | 0.03 | 0.00 | 0.87 | 0.03 | 0.30 |
| HQ ing-nc (AD) | 0.09 | 0.04 | 0.15 | 0.11 | 0.03 | 0.05 | 0.01 | 0.07 | 0.00 | 0.01 | 0.00 | 0.00 | 0.09 | 0.00 | 0.03 |
| HQ drm-nc (CH) | 0.88 | 0.37 | 0.04 | 1.07 | 0.00 | 0.07 | 0.01 |  | 0.00 | 0.00 | 0.00 | 0.00 | 0.86 | 0.00 | 0.01 |
| HQ drm-nc (AD) | 0.13 | 0.06 | 0.01 | 0.16 | 0.00 | 0.01 | 0.00 |  | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| HQ inh-nc (CH) | 0.88 | 0.37 | 0.03 | 1.07 | 0.00 | 0.00 | 0.01 |  | 0.00 | 0.00 | 0.00 |  | 0.87 | 0.00 | 0.00 |
| HQ inh-nc (AD) | 0.50 | 0.21 | 0.02 | 0.60 | 0.00 | 0.00 | 0.01 |  | 0.00 | 0.00 | 0.00 |  | 0.49 | 0.00 | 0.00 |
| A-29 motorway (RURAL) | HQ ing-nc (CH) | 1.12 | 0.40 | 1.18 | 1.00 | 0.63 | 1.03 | 0.10 | 0.75 | 0.03 | 0.27 | 0.10 | 0.00 | 0.33 | 0.00 | 0.10 |
| HQ ing-nc (AD) | 0.12 | 0.04 | 0.13 | 0.11 | 0.07 | 0.11 | 0.01 | 0.08 | 0.00 | 0.03 | 0.01 | 0.00 | 0.04 | 0.00 | 0.01 |
| HQ drm-nc (CH) | 1.12 | 0.40 | 0.03 | 0.99 | 0.00 | 0.14 | 0.01 |  | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 |
| HQ drm-nc (AD) | 0.17 | 0.06 | 0.01 | 0.15 | 0.00 | 0.02 | 0.00 |  | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 |
| HQ inh-nc (CH) | 1.13 | 0.40 | 0.02 | 0.99 | 0.00 | 0.00 | 0.01 |  | 0.00 | 0.00 | 0.00 |  | 0.33 | 0.00 | 0.00 |
| HQ inh-nc (AD) | 0.63 | 0.23 | 0.01 | 0.56 | 0.00 | 0.00 | 0.01 |  | 0.00 | 0.00 | 0.00 |  | 0.19 | 0.00 | 0.00 |