

Particle size distribution and perchlorate levels in settled dust from urban roads, parks, and roofs in Chengdu, China

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Supplementary Materials

Section 1 Equations for exposure evaluation

The daily intake of perchlorate via dust ingestion, inhalation, and dermal contact was calculated for children and adult using the equations listed below:

$$D_{\text{ingestion}} = (C \times \text{IngR} \times \text{EF} \times \text{ED} \times 10^{-6}) / (\text{BW} \times \text{AT}) \quad (1)$$

$$D_{\text{inhalation}} = (C \times \text{InhR} \times \text{EF} \times \text{ED}) / (\text{PEF} \times \text{BW} \times \text{AT}) \quad (2)$$

$$D_{\text{dermal}} = (C \times \text{SA} \times \text{SL} \times \text{ABS} \times \text{EF} \times \text{ED} \times 10^{-6}) / (\text{BW} \times \text{AT}) \quad (3)$$

where D (mg/kg/d) is the daily exposure amount of perchlorate via ingestion ($D_{\text{ingestion}}$), inhalation ($D_{\text{inhalation}}$), and dermal contact (D_{dermal}) of settled outdoor dust; C is the perchlorate concentration in settled outdoor dust (ng/g); IngR is the ingestion rate (mg/d); EF is the exposure frequency; ED is the exposure duration; BW is the average body weight; AT is the average time; InhR is the inhalation rate (m^3/d); PEF is the particle emission factor; SA is the exposed skin area; SL is the skin adherence factor; ABS is the dermal absorption factor. The parameters for exposure evaluation used in this study are given in Table S2.

Table S1 Quality control parameters for the analysis of perchlorate.

QC samples (ng/mL)	N	mean (ng/mL)	RSD (%)	recovery (SD) (%)
Standard solution (1)	17	1.03	3	103 (3.3)
Standard solution (10)	17	10.2	2	102 (2.4)
Standard solution (100)	17	99.2	2	99.2 (1.6)
Procedural blank	17	n.d. ^a	\	\
Reagent blank	17	n.d.	\	\
Spiked 500 - 1000 μm dust samples (100)	3	\	\	94.9 (3.6)
Spiked 250 - 500 μm dust samples (100)	3	\	\	96.5 (1.9)
Spiked 125 - 250 μm dust samples (100)	3	\	\	96.4 (1.9)
Spiked 63 - 125 μm dust samples (100)	3	\	\	96.6 (3.3)
Spiked < 63 μm dust samples (100)	3	\	\	97.9 (4.9)

a: not detected.

Table S2 The parameters for exposure evaluation.

	children		adults	
	A	B	A	B
IngR (mg/d)	60	200	30	100
InhR (m ³ /d)	12	18	15	20
EF (d/year)	350	350	350	350
ED (year)	6	6	24	24
BW (kg)	15	15	70	70
PEF (m ³ /kg)	6.8 × 10 ⁸	6.8 × 10 ⁸	6.8 × 10 ⁸	6.8 × 10 ⁸
SA (cm ²)	2800	2800	5700	5700
SL (mg/cm ² /h)	0.2	0.2	0.07	0.07
ABS	0.001	0.001	0.001	0.001
AT (d)	2190	2190	8760	8760
C _{MT} (ng/g)	1060	3730	1060	3730
C _{< 63 μm} (ng/g)	1800	5190	1800	5190

C_{MT}: mean total perchlorate concentration; C_{< 63 μm}: the finest particle associated perchlorate concentration.