**Data and statistical analyses**

The SPM water partition coefficient Kd (kg SPM or sediment per L water) was calculated as follows [22]:

|  |  |  |
| --- | --- | --- |
|  | Kd = CS/CW | (1) |

where CS (mg PCBs/L SPM) and CW (mg PCBs/L water) are the concentrations of PCBs in the aqueous and solid phases, respectively.

The normalized partition coefficient of organic carbon (KOC) is an empirical value of the steady state environment simulated in the laboratory and can be predicted by KOW (*n*-octanol/water partition coefficient) [23]:

|  |  |  |
| --- | --- | --- |
|  | logKOC = 1.04logKOW − 0.61 | (2) |

KOC\* is the modified normalized partition coefficient of organic carbon found in the field and can be calculated as [24]:

|  |  |  |
| --- | --- | --- |
|  | KOC\* = (CS/CW)/fOC = Kd/fOC | (3) |

where fOC is the mass fraction of the organic carbon in the sediment (based on the measured TOC).

The fugacity of PCBs in sediment and water was calculated as follows [20]:

|  |  |  |
| --- | --- | --- |
|  | $$f\_{S}=\frac{C\_{S}×ρ\_{S}×H}{f\_{OC}×K\_{OW}}$$ | (4) |
|  | fW = CW × H | (5) |

where fS and fW are the fugacity of PCBs in sediment and water, respectively, and ρS is the density of the solid sediment (1.5 × 103 kg/m3 for all calculations).

The fraction of the total fugacity (ff) was calculated as [25]:

|  |  |  |
| --- | --- | --- |
|  | ffSW = fS/(fS + fW) | (6) |

where ffSW represent the fugacity fraction of PCBs in sediment.

The carcinogenic risk and non-carcinogenic risk are calculated as follows [26]:

|  |  |  |
| --- | --- | --- |
|  | $$CR=\frac{Ci×IR×EF×SF}{BW×AT}$$ | (7) |
|  | $$HI=\frac{Ci×IR×EF×ED}{BW×AT×RfD}$$ | (8) |

where C*i* is the concentration of PCBs in water (mg/L); IR is the daily drinking water volume (1.85 L); EF is the adult exposure frequency (365 d/a); SF is the carcinogenic slope factor (2 kg·d/mg); BW is the body weight of an adult (60 kg); AT is the average time of the onset of carcinogenic effect (25550 d); ED is the adult exposure period (70 a); and RfD is the exposure dose (0.02 mg/d·kg). All values were taken from the Chinese population exposure parameter manual [27].