S-Risk for the Walloon region - substance datasheet: Dioxine-2378-TCDD

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Warning: Take care about the specific units of dioxins (in mg_TEQ) used for the assessment of this chemical. For risk assessment in Wallonia, you have to read the "Lignes directrices pour les dioxines" to follow the specific procedure.

List of acronyms

ABS	Absorption factor
Al	Aluminum content
BCF	Bioconcentration factor
BTF	Biotransfer factor
Da	Diffusion coefficient in air
Dpe	Diffusion coefficient in polyethylene
Dpvc	Diffusion coefficient in PVC
Dw	Diffusion coefficient in water
FA	Factor used when calculating dermal absorption from water
Fe	Iron content
ISSeP	Institut Scientifique de Service Public
K_d	Sorption coëfficient soil-water
Koa	Distribution coefficient octanol-air
Koc	Distribution coefficient organic carbon-water
Kow	Distribution coefficient octanol-water
Kp	Dermale permeability coefficient
PAH	polycyclic aromatic hydrocarbons
Ptot	Total phosphorus content
TCA	Tolerable Concentration in Air
TDI	Tolerable Daily Intake
TGD	Technical Guidance Document

Dioxine-2378-TCDD

Physico-chemical parameter	Unit	Value	Source
Name (complete)	-	2,3,7,8-TCDD – dioxine de Seveso	Pubchem
Name S-Risk WAL	-	Dioxine-2378-TCDD	
Molecular formula		$C_{12}H_4Cl_4O_2$	Pubchem
CAS number	-	1746-01-6	Pubchem
EC number	-	217-122-7	Pubchem
Organic	-	Yes	
Dissociating	-	No	
Type Acid/Base	-	/	
Acid constant - pKa		Not applicable	
Molar mass – M	g/mol	321,971	Mackay et al (2006)
Temperature for water solubility - Ts	°C	25	
Water solubility - S	mg/l	2.10^{-4}	Pubchem (HSDB)
Temperature for P - Tp	°C	25	
Vapour pressure - Pa	Pa	2.10^{-7}	Pubchem (HSDB)
Temperature for Henry coefficient - Th	°C	25	
Henry coefficient - H	$Pa.m^3/mol$	$8,393.10^{-1}$	Mackay D. et al. (2006) CALC - Moyenne géométrique de 11 valeurs
Organic carbon-water partition coefficient - Koc	dm^3/kg	430527	
Log Koc		5,634	Mackay et al (2006) – EXP- moyenne géométrique de 16 valeurs
Octanol-water partition coefficient - Kow	-	6 309 573	
Log Kow		6,80	Pubchem (HSDB)
Permeation organic substance through PE pipe - Dpe	m^2/d	1.10^{-7}	Lijzen et al. (2001)
Permeation organic substance through PVC pipe - Dpvc	m^2/d	*(1.10^{-10})*	Calculated by S-Risk
Soil-water distribution coefficient Kd	l/kg	Not relevant	

Exposure parameter	Unit	Value	Source
Dermal permeability coefficient - Kp	cm/h	*(7,673.10^{-1})*	Use model
Dermal absorption factor for soil and dust - ABS dermal soil/dust	-	0,03	US-EPA (2004)
Fraction absorbed water - FA	-	0,8	Hors domaine d'application Fa estimé sur base du user's guide de S-Risk (B = 0.011)

Plant	BCF plant	Source
Potatoes		
Potatoes		Calculation using chemical and plant properties
Root and tuber vegetables		
Carrots		Calculation using chemical and plant properties
Salsify		Calculation using chemical and plant properties
Other root vegetables (such as radish)		Calculation using chemical and plant properties
Bulbous vegetables		
Bulbous vegetables (such as onion)		Calculation using chemical and plant properties
Leek		Calculation using chemical and plant properties
Fruiting vegetables		
Tomato		Calculation using chemical and plant properties
Cucumber		Calculation using chemical and plant properties
Other fruiting vegetables (such as peppers)		Calculation using chemical and plant properties
Cabbages		
Cabbage		Calculation using chemical and plant properties
Cauliflower and broccoli		Calculation using chemical and plant properties
Sprouts		Calculation using chemical and plant properties
Leafy vegetables		
Lettuce		Calculation using chemical and plant properties
Lamb's lettuce		Calculation using chemical and plant properties
Endive		Calculation using chemical and plant properties
Spinach		Calculation using chemical and plant properties
Chicory		Calculation using chemical and plant properties
Celery		Calculation using chemical and plant properties
Legumes		
Beans		Calculation using chemical and plant properties
Peas		Calculation using chemical and plant properties

Grasses		
Grass		Calculation using chemical and plant properties
Cereals		
maize		Calculation using chemical and plant properties

Animal parameter	Unit	Value	Source
Cow meat BTF	(mg/kg fw)/(mg/d)		Calculated by model
Cow liver BTF	(mg/kg fw)/(mg/d)		Calculated by model
Cow kidney BTF	(mg/kg fw)/(mg/d)		Calculated by model
Cow milk BTF	(mg/kg fw)/(mg/d)		Calculated by model
Sheep meat BTF	(mg/kg fw)/(mg/d)		Calculated by model
Chicken - soil to egg BTF	(mg/kg fw)/(mg/d)	0	
Chicken - feed to egg BTF	(mg/kg fw)/(mg/d)	0	

Limit value	Unit	Value	Source
Drinking water	µg/l		
Outdoor air	mg/m³	$2{,}6.10^{-11}$	AWAC
Indoor air	mg/m³	$2{,}6.10^{-11}$	AWAC

Toxicological Reference value	Unit	Value	Source
Systemic effects threshold			
TCA inhalatory	**mg_TEQ/m³**	2.10^{-9}	EGLE (2012) – Validated by TRV Steering Committee 06/05/2021
TDI oral	**mg_TEQ/(kg.d)**	$2{,}860.10^{-10}$	EFSA (2018) - Validated by TRV Steering Committee 06/05/2021
TDI dermal	**mg_TEQ/(kg.d)**	$2{,}860.10^{-10}$	= TDI oral
Systemic effects non-threshold			
Unit risk for inhalation	**$(mg\_TEQ/m^3)^{-1}$**	$3{,}8.10^{4}$	OEHHA (2009) – Validated by TRV Steering Committee 06/05/2021
Oral slope factor	**$(mg\_TEQ/kg.d)^{-1}$**	$1{,}3.10^{5}$	OEHHA (2009) – Validated by TRV Steering Committee 06/05/2021
Dermal slope factor	**$(mg\_TEQ/kg.d)^{-1}$**	$1{,}3.10^{5}$	= Oral SF

References

Dioxines et PCBs de type dioxine (PCDD/F, PCB-DL) - Dossier de rapportage de sélection de VTRs par procédure simplifiée, Comité VTR, 06/05/2021, 21_Dossier simplifié PCDD F PCB DL_vf

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Mackay D. et al. (2006). Handbook of Physical-Chemical Properties and Environmental Fate for organic Chemicals. Vol I à IV - Second Edition

US-EPA (2004). Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

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