

Summary report for Cobalt

SUMMARY

Substance name	Cobalt		
CAS-number	7740-48-4		
Proposed Quality Standard	Freshwater*		
		AA-QS	MAC-QS
Water AF	0.3 µg/L + BC		2.8 µg/L + BC
Sediment EP	0.7 mg/kg dw + BC		7.4 mg/kg dw + BC
Remarks	Added RA for water (lack of data for BC) Added RA for sediment (lack of data for BC)		

* marine and freshwater data

1. IDENTITY

Substance name	Cobalt
CAS-number	7740-48-4
Substance group	metals
Synonyms	/
Molecular formula	Co
Structural formula	/

2. PHYSICO-CHEMICAL PROPERTIES

Property	values	ref.
Molecular weight (g/mol)	58.9332	http://chemfinder.combridgesoft.com/
Vapour Pressure (Pa)	/	
Water Solubility (mg/L)	/	
Log K _{ow}	/	
Log K _{oc}	/	
Log K _{SED}	3.60 (10% OC) → 3.424 (5% OC)	a
Henry-coefficient (Pa·m ³ /mol)	/	
pKa	/	

a Crommentuijn T., Polder M.D., van der Plassche E., Maximum Permissible Concentration and Negligible Concentration for metals, taking background concentrations into account, RIVM Bilthoven, 1997

3. FATE AND BEHAVIOUR IN THE ENVIRONMENT

Characteristic		ref.
BCF	/	
(Aerobic bio)degradation	/	

4. ECOTOXICITY

4.1 Aquatic toxicity data from RIVM database^a and EPA Ecotox database^b

Species	Endpoint-acute	Value – (mg/l)	Endpoint-chronic	Value – (mg/l)	ref.	Number of tests for species	F/M	AF MAC-QS	AF AA-QS	MAC-QS (µg/l)	AA-QS (µg/l)
Algae											
<i>Chlorella vulgaris</i> (Green algae)			3-4mon-NOEC	0.0042	EPA Ecotox	2	F				
Invertebrates											
<i>Daphnia magna</i> (cru)			28d-NOEC	0.0028	EPA Ecotox	>3	F	1	10	2.8*	0.28=0.3
<i>Ceriodaphnia dubia</i> (cru)			7d-NOEC	0.050	EPA Ecotox	5	F				
Fish											
<i>Carassius auratus</i>	7d-EC50	0.81			RIVM database	1	F				
<i>Oncorhynchus mykiss</i>	28d-EC50	1.6 ^c			RIVM database	>2	F				
<i>Danio rerio</i>			<4d-NOEC	3.84	EPA Ecotox	4	F				
<i>Pimephales promelas</i>			28d-NOEC	0.21	EPA Ecotox	9	F				
Other											
<i>Gastrophryne carolinensis</i> (Anura-amp)	7d-EC50	0.05			RIVM database	1	F	100		0.5	
<i>Vibrio fischeri</i> (bac)	30min-EC50	28.5			RIVM database	1	M				
<i>Xenopus laevis</i> (amp)			4d-NOEC	2.48	EPA Ecotox	1	F				

a RIVM e-toxBASE, Bilthoven, 2004

b <http://www.epa.gov/ecotox/>

c MAC-QS derived from NOEC (AF = 1) is protective for all species

4.2 Sediment toxicity

Equilibrium partitioning method-calculated with $\log K_{sed} = 3.424$

AA-QS sed = $2655 \text{ L/kg} * 0.00028 \text{ mg/L} = 0.74 \text{ mg/kg dw} = 0.7 \text{ mg/kg dw}$

MAC-QS sed = $2655 \text{ L/kg} * 0.0028 \text{ mg/L} = 7.4 \text{ mg/kg dw}$