

HAZARDOUS SUBSTANCE ECOLOGICAL FACT SHEET

U.S. Environmental Protection Agency
Office of Toxic Substances

Chemical Name: o-Cresol

CAS Number: 95-48-7

GENERAL INFORMATION

o-Cresol (2-methylphenol) is a crystalline solid at temperatures up to 30° C, above which it is a yellowish liquid. It has a phenolic odor, and darkens with exposure to air and light. It is used as a disinfectant, solvent, and food antioxidant; in the manufacture of dyes, perfumes, herbicides, plastics and resins; in ore flotation, and as an intermediate in the production of other chemicals. o-Cresol is highly soluble in water, and may enter the aquatic environment via effluents from chemical plants where it is manufactured or used, domestic waste treatment plant discharges, or spills.

ACUTE (SHORT-TERM) ECOLOGICAL EFFECTS

Acute or short-term ecological effects are severe effects upon aquatic animals or plants, such as death or complete immobilization, which occur following exposure to a chemical in water for a relatively short period of time, such as four days or less. o-Cresol is considered to have moderate acute toxicity to aquatic life.

CHRONIC (LONG-TERM) ECOLOGICAL EFFECTS

Chronic or long-term ecological effects are generally subtle effects upon aquatic animals or plants, such as reductions in long-term survival, growth, or reproduction; or changes in appearance or behavior following exposure to a chemical in water for a sufficient period of time to include either a complete life-cycle or a significant portion of a life-cycle. o-Cresol is considered to have high chronic or long-term toxicity to aquatic life.

DISTRIBUTION AND PERSISTENCE IN THE ENVIRONMENT

The chemical properties of o-cresol indicate that, after a sufficient amount of time, it will tend to be distributed in the environment as follows:

air	55.51%
soil	0.46%
water	43.60%
suspended solids	< 0.01%
aquatic biota	< 0.01%
sediment	0.43%

o-Cresol will probably be slightly persistent in aquatic ecosystems.

BIOACCUMULATION IN AQUATIC ORGANISMS

The concentration of o-cresol in edible tissues of most aquatic species that are consumed by humans will probably be somewhat higher than the average concentration that was present in the water in which the organisms had been living.

U.S. Environmental Protection Agency
Environmental Research Laboratory-Duluth

I. Chemical Identification

Name Phenol, 2-methyl-
CAS number 95-48-7
Formula C7 H8 O

II. Chemical and Physical Properties from QSAR

(All temperature sensitive values assume 25 C)

Molecular Weight (g/mole) = 108.1
Melting Point (C) = 31.0
Boiling Point (C) = 191.
Vapor Pressure (mm of Hg) = 0.425
Ht Vaporization (cal/mole) = 1.10E+04
Solubility in Water (mg/L) = 1.66E+03
Log P = 2.12
pKa = 10.2

III. Information from QSAR concerning Exposure and Fate

Bioconcentration Factor = 19.0
Log(BCF) = 1.28 See Veith and Kosian 1983
Absorption Coef. Log(Koc) = 2.49 See Lyman et al. 1982
Hydrolysis Half-Life > 1000 days

Hydrolysis is not likely to be an important transformation mechanism for this chemical

Henry's Constant = 3.63E-05 atm-m**3/mole
Log10 (Henry's Constant) = -4.44 atm-m**3/mole

Lyman et al. 1982. would conclude that a chemical with these properties will volatilize at significant rates from open water. See page 15-15.

Mackay Level 1 Environmental Partitioning @25 C Fugacity = 2.293E-05 Pa
55.51 % into air
0.46 % into soil
43.60 % into water
0.00 % into suspended solids
0.00 % into aquatic biota
0.43 % into sediment

Biodegradation Half-life Analysis

***** QSAR OPENED SUBFILE 2 FOR AROMATIC CHEMICALS *****
EVALUATIONS OF DEGRADATION WITHIN THIS SUBFILE WERE BASED
ON 86 OR ABOUT 32 % OF THE CHEMICALS IN THE DATA BASE.

THERE ARE 25 CHEMICALS IN THE DEGRADATION
DATA BASE WITH A BENZENE RING AND A LOGP OF < 2.18. HALF-LIFE FOR
ALL THESE CHEMICALS RANGE FROM 2 TO 16 DAYS.

IV. Toxicological Information from QSAR

Toxicity to the fathead minnow

LC50 (mg/L)	=	18.2
MATC (mg/L)	=	3.91

Phytotoxicity Assessment

The rules for distinguishing substructures which may have inhibitory effects on plant growth and development are being formulated by Dr. Fumihiko Hayashi of the Office of Toxic Substances, Washington, D.C.
HERD/EEB Room E431 Phone (202)382-4278.

This chemical does not contain structural features which the QSAR SYSTEM now regards as highly toxic to algae or aquatic plants.

Genetic/Mutagenic Assessment

There is no information in the QSAR SYSTEM which would suggest that this chemical is a potential carcinogen or mutagen.

V. AQUIRE SUMMARY

Name Phenol, 2-methyl-

CAS number 95-48-7

Effect	Dur (days)	Ex Ty	Life Stage	Conc Type	Concentration (ug/l)	Md	Ref no.
AQUATIC SOWBUG ASELLUS AQUATICUS							
LC50	2.00	S	NR	F	23000	U	15788
ATLANTIC COD GADUS MORHUA							
EC50	4.00	S	EGG	F	12000	M	11059
BLUE-GREEN ALGAE ANACYSTIS AERUGINOSA							
MOR		S	NR	F	6800	U	2463
PGR	8.00	S	NR	F	6800	U	15134
BLUEGILL LEPOMIS MACROCHIRUS							
LC50	1.00	S	3.8-6.4 CM, 1-2 G	F	22170	U	728
LC50	2.00	S	3.8-6.4 CM, 1-2 G	F	20780	U	728
LC50	4.00	S	3.8-6.4 CM, 1-2 G	F	20780	U	728
LC0*	4.00	S	FINGERLING, 38-76 M	F	11500	U	2458
CILIAE TETRAHYMENA PYRIFORMIS							
EC50PP	2.50	S	NR	F	203390	U	10903
CLAWED TOAD XENOPUS LAEVIS							
LC50	2.00	S	3-4 WK	F	38000	U	9740
COMMON, MIRROR, COLORED, CARP CYPRINUS CARPIO							
MOR	2.75	D	NR	F	72 MG/KG 194 MG/KG	U	15898

CRYPTOMONAD
CHILOMONAS PARAMECIUM

PGR 2.00 NR NR F 132000 U 5719

DRAGONFLY
ISCHNURA ELEGANS

LC50 2.00 S NR F 46000 U 15788

DUCKWEED
LEMNA MINOR

LC50* 3.00 S NR F 750000* U 2231

FATHEAD MINNOW
PIMEPHALES PROMELAS

LC50 1.00 S 3.8-6.4 CM, 1-2 G F 18000 U 728
 LC50 2.00 S 3.8-6.4 CM, 1-2 G F 13420 U 728
 LC50* 2.00 S NR F 24000 U 2455
 LC50 2.00 NR 3-4 WK F 34000 U 10574
 LC50 4.00 S 3.8-6.4 CM, 1-2 G F 12550 U 728
 LC50 4.00 S 3.8-6.4 CM, 1-2 G F 13420 U 728
 LC50 4.00 F 5.0 CM, 1.5 G F 18200 M 569

FLAGELLATE EUGLENOID
ENTOSIPHON SULCATUM

PGR 3.00 S INITIAL CULTURE TU F 17000 U 5303
 RBIDITY REPORTED

GOLDEN SHINER
NOTEMIGONUS CRYSOLEUCAS

LET 0.03 S NR F 103000* U 2586

GOLDFISH
CARASSIUS AURATUS

LC50 4.00 S 3.8-6.4 CM, 1-2 G F 23250 U 728

GREAT POND SNAIL
LYMNAEA STAGNALIS

LC50 2.00 NR 3-4 WK F 160000 U 10574

LC50 2.00 S NR F 160000 U 15788

GREEN ALGAE
CHLORELLA AUTOTROPHICA

PGR 3.00 S EXPO GROWTH PHASE F 10000 UG U 7433
7.00

PGR 3.00 S EXPO GROWTH PHASE F 2000 UG U 7433
7.00

GREEN ALGAE
CHLORELLA PYRENOIDOSA

GRO 2.00 NR LOG PHASE F 34000 U 10574

CLR 3.00 S NR F 1000000 U 15189

GREEN ALGAE
SCENEDESMUS PANNONICUS

GRO 2.00 NR LOG PHASE F 36000 U 10574

GREEN ALGAE
SCENEDESMUS QUADRICAUDA

PGR S NR F 11000 U 7453

MOR S NR F 11000 U 2463

PGR 7.00 S INITIAL CULTURE TU F 11000 U 5303
RBIDITY REPORTED

PGR 8.00 S NR F 11000 U 15134

GREEN ALGAE
SELENASTRUM CAPRICORNUTUM

GRO 4.00 NR LOG PHASE F 65000 U 10574

GUPPY
POECILIA RETICULATA

LC50 1.00 S 6 M, 1.9-2.5 CM, 0 F 49130 U 728
.1-0.2 G

LC50 2.00 S 6 M, 1.9-2.5 CM, 0 F 25310 U 728
.1-0.2 G

LC50 4.00 S 6 M, 1.9-2.5 CM, 0 F 18850 U 728
.1-0.2 G

HYDRA
HYDRA OLIGACTIS

LC50 2.00 NR BUDLESS F 75000 U 10574

LC50 2.00 S NR F 75000 U 15788

IDE, SILVER OR GOLDEN ORFE
LEUCISCUS IDUS

LC50 4.00 S NR F 10000 U 11037

LEECH
ERPOBDELLA OCTOCULATA

LC50 2.00 S NR F 135000 U 15788

MAYFLY
CLOEON DIPTERUM

LC50 2.00 S NR F 50000 U 15788

MEDAKA, HIGH-EYES
ORYZIAS LATIPES

LC50 2.00 NR 4-5 WK F 41000 U 10574

MIDGE
CHIRONOMUS THUMMI

LC50 2.00 S NR F 34000 U 15788

MOSQUITO
AEDES AEGYPTI

LC50 2.00 NR 3RD INSTAR F 80000 U 10574

MOSQUITO
CULEX PIPIENS

LC50 2.00 NR 3RD INSTAR F 46000 U 10574

MOZAMBIQUE TILAPIA
TILAPIA MOSSAMBICA

LC50 S 7.0-8.0 CM F 23500 U 12615

OLIGOCHAETE FAMILY
TUBIFICIDAE

LC50 2.00 S NR F 165000 U 15788

ORANGESPOTTED SUNFISH
LEPOMIS HUMILIS

LC100 0.04 S 4-6 G F 55000 65000 U 2409

RAINBOW TROUT, DONALDSON TROUT
SALMO GAIRDNERI

LC50	2.00 NR	5-8 WK	F	13000	U 10574
LC50	4.00 F	7.9 CM, 5.1 G	F	8400	M 569

SALAMANDER
AMBYSTOMA MEXICANUM

LC50	2.00 S	3-4 WK	F	40000	U 9740
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SAND SHRIMP
CRANGON SEPTEMPINOSA

LC50	2.46 R	0.6G, 3.8CM	F	14200	M 5810
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SCUD
ELASMOPUS PECTINICRUS

LC50	1.00 R	ADULT	F	16000	U 5013
LC50	2.00 R	ADULT	F	11800	U 5013
LC50	4.00 R	ADULT	F	10200	U 5013

SCUD
GAMMARUS PULEX

LC50	2.00 S	NR	F	21000	U 15788
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SEA URCHIN
STRONGLYOCENTROTUS DROEBACHIEN

EC50	4.00 S	FERTILIZED EGG	F	30000	M 11059
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STONEFLY
NEMOURA CINEREA

LC50	2.00 S	NR	F	10000	U 15788
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TURBELLARIAN, PLANARIAN
DUGESIA LUGUBRIS

LC50	2.00 S	NR	F	24000	U 15788
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WATER BOATMAN
CORIXA PUNCTATA

LC50	2.00 S	NR	F	80000	U 15788
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WATER FLEA
DAPHNIA CUCULLATA

LC50	2.00 S	11 D	F	17400	U	2017
LC50	2.00 S	11 D	F	15500	U	2017

WATER FLEA
DAPHNIA MAGNA

LC50	1.00 S	24 H	F	19000	U	5718
EC50IM	2.00 S	12 H	F	15800*	U	2120
LC50	2.00 NR	NR	F	5000	U	553
LC50	2.00 S	< 1 D	F	14000	U	2017
LC50	2.00 S	< 1 D	F	9800	U	2017
LC50	2.00 S	< 1 D	F	8600	U	2017
LC50	2.00 S	< 1 D	F	23800	U	2017
LC50	2.00 S	< 1 D	F	23100	U	2017
LC50	2.00 S	< 1 D	F	15100	U	2017
LC50	2.00 S	NR	F	15800*	U	7458
LC50	2.00 NR	NR	F	15800*	U	15251

WATER FLEA
DAPHNIA PULEX

LC50	2.00 S	< 1 D	F	10800	U	2017
LC50	2.00 S	< 1 D	F	8500	U	2017

WATER FLEA
DAPHNIA PULICARIA

LC50	2.00 F	NR	F	> 94000	M	569
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ZEBRA DANIO, ZEBRAFISH
BRACHYDANIO RERIO

LC50	4.00 S	NR	F	24000	U	11037
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