

## ASTER ECOTOXICITY PROFILE

U.S. Environmental Protection Agency  
 Office of Research and Development  
 National Health and Environmental Effects Research Laboratory  
 Mid-Continent Ecology Division  
 (formerly the Environmental Research Laboratory-Duluth)

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## I. CHEMICAL IDENTIFICATION

Name Nitric acid  
 CAS number 7697-37-2  
 SMILES O=N(=O)O{-1}.H{+1}  
 Formula H.N O3

## II. ENVIRONMENTAL EXPOSURE ASSESSMENT

Parameter	Value	Source	Reference
Molecular Weight (g/mole)	63.01	Calc.	
Melting Point (C)	not available for this chemical		
Boiling Point (C)	72.0	Calc.	
Vapor Pressure (mm of Hg)	123.	Calc.	
Ht Vaporization (cal/mole)	8.65E+03	Calc.	
Solubility in Water (mg/L)	not available for this chemical		
Log P	not available for this chemical		
pKa	not available for this chemical		
Adsorption Coef (log Koc)	not available for this chemical		
Henry's Constant (atm-m**3/mole)	not available for this chemical		
Log10(Henry's Constant) (atm-m**3/mole)	not available for this chemical		
Hydrolysis Half-life (days)	hydrolysis unlikely		
BOD Half-life:	Calc.		
THIS IS A HYDROCARBON WITH A HALF-LIFE RANGE FROM 3 TO 17 DAYS. ALEXANDER (1965) STATES THAT HYDROCARBONS ARE "INHERENTLY BIODEGRADABLE" BUT ARE PERSISTENT UNDER ANAEROBIC CONDITIONS			

No value was available for aqueous solubility  
 No value was available for log P (log Kow)  
 There is not enough information for the fugacity model

## III. ECOTOXICOLOGICAL HAZARD ASSESSMENT

Aquatic Hazard Identification

\*\* Researchers and managers using AQUIRE data for analysis or summary \*\*  
\*\* projects should consult with the original scientific paper to ensure \*\*  
\*\* an understanding of the content of the data retrieved from AQUIRE. \*\*

Human Health Hazard Identification

MODEL GENETOX.CAN DOESN'T EXIST YET

#### IV. ECOLOGICAL RISK CHARACTERIZATION

##### A. Environmental Exposure Assessment

CLOGP3 can't do disconnected structures  
Log P is needed to estimate solubility in water  
Solubility in water is needed to estimate Henry's constant

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

##### B. Ecotoxicological Hazard Assessment

###### Genetic/Mutagenic Assessment

MODEL GENETOX.CAN DOESN'T EXIST YET

NONPOLAR NARCOSIS The acute mode of toxic action for this class of xenobiotics is generally attributed to narcosis (the toxicologically induced and reversible stages of neural disruption, i.e. general anesthesia). Intoxication via nonpolar narcosis is thought to be the minimal effect that can be elicited by a xenobiotic and the QSAR for nonpolar narcosis provides predictions of baseline acute toxicity [3261]. Chemicals that act via a more specific mode of action, or are metabolically activated, will generally be more toxic than what would be predicted by the nonpolar narcosis QSAR. The acute toxicity modeling component in ASTER assesses the structural characteristics of chemicals and evaluates whether or not an entered compound contains specific functional moieties (or moieties capable of being bioactivated) that are associated with more specific modes of toxic action. The nonpolar narcosis QSAR is invoked only if the structural characteristics of a chemical do not suggest that a more specific mode of action may be involved.

When sufficient data is available from fathead minnow early life stage (ELS) tests (32-d exposures) completed at ERL-Duluth, QSAR models have been developed to predict chronic values for either survival or growth, whichever is the most sensitive endpoint. A chronic value is defined as the geometric mean of the LOEC (lowest observable effect concentration) and the NOEC (no observable effect concentration). These models have been developed for groups of xenobiotics that have been classified based on their acute modes of toxic action. Empirical observations suggest that when a statistically robust ELS QSAR can be established and when 96-h LC50/32-d ELS chronic value ratios are within a factor of 20 it is reasonable to assume that

adverse effects are elicited through the same mode of toxic action in both 4-d and 32-d exposures. If during a chronic exposure a different mode of action is involved, or if metabolic activation is significant, the ratios between acute and chronic endpoint values for a group of xenobiotics are generally quite variable and typically exceed two orders of magnitude. In addition, the statistical strength of ELS QSARs in these instances are poor.

CLOGP3 can't do disconnected structures

Log P is needed to estimate ELS chronic toxicity

#### C. Other Information

This chemical appears on the SARA (Superfund Amendments and Reauthorization Act) Title III Toxic Emissions Inventory.

#### V. CITATION INFORMATION

REFERENCE NUMBER: 3261

Franks, N.P. and W.R. Lieb

1990

Mechanisms of General Anaesthesia

Environ. Health Perspect. 87:199-205

ASTER ECOTOXICITY PROFILE  
Other Data from AQUIRE

ASTER processes all Ecotoxicological Hazard Assessment information through a filter which removes data from the final Report which may not be of the highest quality. This appendix contains Other Data that did not meet the filter requirements, but is contained in the AQUIRE database.

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II. Additional data from the AQUIRE database

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ACUTE DATA

Species Common Name	Ex	Duratio	Endpoint	Conc	Conc		Ref
Species Latin Name	Ty	(days)		Effect	Type	(ug/L)	No.

SALT WATER

Green or European shore cr Carcinus maenas	R	2.00	LC50	MOR		180000	906
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OTHER DATA

Species Common Name	Ex	Duratio	Endpoint	Conc	Conc		Ref
Species Latin Name	Ty	(days)		Effect	Type	(ug/L)	No.

FRESH WATER

Bryozoa Pectinatella gelatinosa	NR	0.17	NR	~REP		1.0 M	705
Bryozoa Pectinatella gelatinosa	NR	.021	NR	~REP		>0.5 M	705
Brook trout Salvelinus fontinalis	S	.000- 1.00	NR-LETH	MOR		1562.5	14120

SALT WATER

Starfish Asterias rubens	R	2.00	LC50	MOR		100000 - 330000	906
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Cockle	R	2.00	LC50	MOR	330000 - 1000000	906
Cerastoderma edule						
Hooknose or pogge	R	2.00	LC50	MOR	100000 - 330000	906
Agonus cataphractus						

III. CITATION INFORMATION

REFERENCE NUMBER: 705

Mukai, H.  
1977

Effects of Chemical Pretreatment on the Germination of  
Statoblasts of the Freshwater Bryozoan, *Pectinatella*  
*gelatinosa*  
Biol. Zentralbl. 96:19-31

REFERENCE NUMBER: 906

Portmann, J.E. and K.W. Wilson  
1971

The Toxicity of 140 Substances to the Brown Shrimp and Other  
Marine Animals  
Shellfish Information Leaflet No. 22 (2nd Ed.), Ministry of  
Agric. Fish. Food, Fish. Lab. Burnham-on-Crouch, Essex, and  
Fish Exp. Station Conway, North Wales:12 P.

REFERENCE NUMBER: 14120

Belding, D.L.  
1927

Toxicity Experiments with Fish in Reference to Trade Waste  
Pollution. I. The Problem of Water Pollution  
Trans. Am. Fish. Soc. 57:100-119