



# Water Contaminant Information Tool

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# What is WCIT?



- The Water Contaminant Information Tool (WCIT) is EPA's secure Web-based database of information on priority contaminants of concern for "all-hazards" in drinking water and wastewater systems:
  - Released in 2005
  - Describes contaminants that pose a serious threat if accidentally or intentionally introduced into water systems
  - Data are peer-reviewed and regularly updated
  - Data are specific to the needs of drinking water and wastewater systems



# Added 703 Contaminants



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<a href="#">Acetophenone</a>		Lab Methods
<a href="#">1-Acetyl-2-thiourea</a>		Lab Methods
<a href="#">Acrolein</a>	Organic	WCIT Profile

# Analytical Methods



Field and Laboratory Methods								
Method Number	Method (Descriptive Name)	Flag	Media	Source	Rapidity	Screening	Confirmatory	Instrumentation
<a href="#">1624</a>	Volatile Organic Compounds by GC/MS		WATER	<a href="#">U.S. EPA Engineering and Analysis Division</a>	Moderate (1-3 hrs.)	No	Yes	GC-MS
<a href="#">524.2</a>	VOCs in Water Using GCMS		WATER	<a href="#">U.S. EPA National Exposure Research Laboratory (NERL) [formerly EMSL]</a>	Moderate (1-3 hrs.)	Possibly	Yes	GC-MS
<a href="#">603</a>	Acrolein and Acrylonitrile Purge and Trap via GC with Flame Ionization Detector (FID)		WATER	<a href="#">U.S. EPA Engineering and Analysis Division</a>	Moderate (1-3 hrs.)	No	Possibly	GC-FID
<a href="#">624</a>	Purgeable Organic Compounds via GC/MS		WATER	<a href="#">U.S. EPA Engineering and Analysis Division</a>	Moderate (1-3 hrs.)	No		GC-MS
<a href="#">8015C</a>	Nonhalogenated Organics by GC-FID		VARIOUS	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No	Possibly	GC-FID
<a href="#">8031</a>	Acrylonitrile in Water Using Gas Chromatography		WATER	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No	Possibly	GC-NPD
<a href="#">8260B</a>	Volatile Organic Compounds by GC/MS		VARIOUS	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No		GC-MS
<a href="#">8316</a>	Acrylamide, Acrylonitrile, and Acrolein by HPLC		WATER	<a href="#">U.S. EPA Office of Solid Waste</a>	Rapid (< 1 hr.)	Possibly	Yes	HPLC-UV

# Contaminant Profile



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- Wastewater Treatment
- Infrastructure Decontamination

**CHECK ALL**

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## Contaminant Name: Aldicarb

[VIEW GLOSSARY](#)

### General Contaminant Information

To view a description of contaminant data or reference flags click on the asterisk (\*).

Contaminant Type	Pure agent
Description	In its pure form, aldicarb is a white crystalline solid, with a slight sulfurous odor. It is a non-volatile carbamate compound, and is used as an insecticide.
Chemical Abstract Services (CAS) ID	116-06-3
Chemical Abstract Services (CAS) ID Notes	-
Category	Organic <a href="#">*</a>
Subcategory(ies)	Non-volatile , Carbamate - urea
Threat Category(ies)	Environmental <a href="#">*</a> , Public Health <a href="#">*</a>
Threat Notes	-
Taste of Pure Contaminant	No data found
Odor of Pure Contaminant	Sulfur-like
Color of Pure Contaminant	Color Group: White Color: White

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### Contaminant Summary

Description	Aldicarb is a white, crystalline, carbamate pesticide with a slightly sulfurous odor.
Threat Type	Aldicarb is a public health and environmental threat. It is toxic to humans.

# Search – Search Select Fields



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### Advanced Search

**Search Term(s)**

**Search All Tables**     **Choose Tables to Search**   

<input checked="" type="checkbox"/> General Information	<input checked="" type="checkbox"/> Contaminant Summary	<input checked="" type="checkbox"/> Other Names/Forms	<input checked="" type="checkbox"/> Physical Properties
<input checked="" type="checkbox"/> Availability	<input checked="" type="checkbox"/> Fate and Transport	<input checked="" type="checkbox"/> Medical Information	<input checked="" type="checkbox"/> Toxicity Information
<input checked="" type="checkbox"/> Field and Lab. Methods	<input checked="" type="checkbox"/> Drinking Water Treatment	<input checked="" type="checkbox"/> Water Quality Indicators	<input checked="" type="checkbox"/> Environmental Indicators
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**AND** Select criteria from the options below.  
To select multiple items, hold down the CTRL or Shift key while making your selections.

<b>Contaminant Category</b>	-All Categories- <input type="button" value="v"/>
<b>Subcategory</b>	-Select a category to view subcategories- <input type="button" value="v"/>
<b>Product/Trade Name</b>	<input type="text"/>
<b>Threat Category</b>	-All Threat Categories- <input type="button" value="v"/> Environmental <input type="button" value="v"/> Infrastructure <input type="button" value="v"/>

# Contamination Scenario



# Phorate and Malathion



## Contaminant Profile

Search Term: **skunk**

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**Contaminant Name: Phorate**

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### General Contaminant Information

To view a description of contaminant data or reference flags click on the asterisk (\*).



Contaminant Type	Pure agent
Description	Phorate is a colorless to pale-yellow liquid with a skunk-like odor. It is an organophosphate with low-volatility, and is used as an insecticide, nematicide, and acaricide.
Chemical Abstract Services (CAS) ID	298-02-2
Chemical Abstract Services (CAS) ID Notes	-
Category	Organic
Subcategory(ies)	Organophosphate , Semi-volatile
Threat Category(ies)	Environmental*, Public Health*
Threat Notes	-



# Laboratory Methods Table




## Field and Laboratory Methods

Method Number	Method (Descriptive Name)	Flag	Media	Source	Rapidity	Screening	Confirmatory	Instrumentation
<a href="#">8141B (by GC-FPD)</a>	Organophosphorus Compounds in Water, Soil, and Waste Samples by GC-FPD		VARIOUS	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No	Yes	GC-FPD
<a href="#">8141B (by GC-NPD)</a>	Organophosphorus Compounds in Water, Soil, and Waste Samples by GC-NPD		VARIOUS	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No	Yes	GC-NPD
<a href="#">8270D</a>	Semivolatile Organic Compounds by GC/MS		VARIOUS	<a href="#">U.S. EPA Office of Solid Waste</a>	Moderate (1-3 hrs.)	No	Yes	GC-MS
<a href="#">EP 014</a>	EnviroLogix Cholinesterase Screening Test		VARIOUS	<a href="#">EnviroLogix, Inc</a>	Moderate (1-3 hrs.)	Yes	No	SPECTR

# Detailed Method Summary



## Method Summary

Method Information	<b>Descriptive Name:</b> Semivolatile Organic Compounds by GC/MS
	<b>Official Name:</b> Semivolatile Organic Compounds by GC/MS
Media	VARIOUS
Subcategory	Organic
Method Source	+ U.S. EPA Office of Solid Waste
Citation	+ SW-846 Update IVA
Brief Method Summary	<p>The samples are prepared for analysis by gas chromatography/mass spectrometry (GC/MS) using the appropriate sample preparation (refer to Method 3500) and, if necessary, sample cleanup procedures (refer to Method 3600). The semivolatile compounds are introduced into the GC/MS by injecting the sample extract into a gas chromatograph (GC) with a narrow-bore fused-silica capillary column. The GC column is temperature-programmed to separate the analytes, which are then detected with a mass spectrometer (MS) connected to the gas chromatograph. Analytes eluted from the capillary column are introduced into the mass spectrometer via a jet separator or a direct connection. Identification of target analytes is accomplished by comparing their mass spectra with the electron impact (or electron impact-like) spectra of authentic standards. Quantitation is accomplished by comparing the response of a major (quantitation) ion relative to an internal standard using a five-point calibration curve.</p> <p>NOTE: This method can be used in conjunction with the following sample preparation procedures:                      Air (particulates and sorbent resin)- Method 3542                      Water (including TCLP leachates) - Methods 3510, 3520, 3535                      Soil/sediment - Methods 3540, 3541, 3545, 3546 3550, 3560, 3561                      Waste - Methods 3540, 3541, 3545, 3546, 3550, 3560, 3561, 3580</p>
Scope and Application	Method 8270 is used to determine the concentration of semivolatile organic compounds in extracts prepared from many types of solid waste matrices, soils, air sampling media and water samples. Direct injection of a sample may be used in limited applications.
Applicable Conc Range	None given
Method Download	 <a href="#">Download full method now (PDF file)</a>
Interferences	(1) Contaminants from glassware. (2) Matrix interferences that are co-extracted with sample. (3) Contamination by carryover can occur whenever high-concentration and low-concentration samples are sequentially analyzed. To reduce carryover, the sample syringe must be rinsed with solvent between sample injections. Whenever an unusually concentrated sample is encountered, it should be followed by the analysis of solvent to check for cross-contamination.

neutralization. Both acid and base are recommended to be used in aqueous solution and analyzed with ultraviolet (UV) detection.

Method	Instrumentation
	GC-FPD
	GC-NPD
	GC-MS
	SPECTR

Biological Warfare

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# Analytical Method – PDF file



METHOD 8270D

SEMIVOLATILE ORGANIC COMPOUNDS  
BY GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)

1.0 SCOPE AND APPLICATION

1.1 Method 8270 is used to determine the concentration of semivolatile organic compounds in extracts prepared from many types of solid waste matrices, soils, air sampling media and water samples. Direct injection of a sample may be used in limited applications. The following compounds can be determined by this method:

Compounds	CAS No <sup>a</sup>	Appropriate Preparation Techniques <sup>b</sup>				
		3510	3520	3540/ 3541	3550	3580
Acenaphthene	83-32-9	X	X	X	X	X
Acenaphthylene	208-96-8	X	X	X	X	X
Acetophenone	98-86-2	X	ND	ND	ND	X
2-Acetylaminofluorene	53-96-3	X	ND	ND	ND	X
1-Acetyl-2-thiourea	591-08-2	LR	ND	ND	ND	LR
Aldrin	309-00-2	X	X	X	X	X
2-Aminoanthraquinone	117-79-3	X	ND	ND	ND	X
Aminoazobenzene	60-09-3	X	ND	ND	ND	X
4-Aminobiphenyl	92-67-1	X	ND	ND	ND	X
3-Amino-9-ethylcarbazole	132-32-1	X	X	ND	ND	ND
Anilazine	101-05-3	X	ND	ND	ND	X

Neutralization. Both acid and base neutralization are recommended to be used in aqueous solution with ultraviolet (UV) fluorescence detection.

Method	Instrumentation
GC-FPD	
GC-NPD	
GC-MS	
SPECTR	

Biological Warfare

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mal

- Malachite green
- Malaoxon
- Malathion
- Maleic anhydride
- Malononitrile
- Burkholderia mallei
- Burkholderia pseudomallei
- Formaldehyde

Contaminant	Category	Available Data
me		
	Biotoxin	WCIT Profile
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		Lab Methods
		Lab Methods
		Lab Methods
		Lab Methods
		Lab Methods
		Lab Methods
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	Organic	WCIT Profile
		Lab Methods
		Lab Methods

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CHECK ALL

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VIEW REFERENCES

**Contaminant Name: Malathion**

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### General Medical Information

For information pertaining to personal protective equipment, please use the link to emergency response info when a link is provided.

<b>Subpopulations at Risk</b>	Young child (1yr) - young adolescent (16yr), Pregnant
<b>Prophylaxis Description</b>	-
<b>Link to Emergency Response Info</b>	<a href="http://www.cdc.gov/niosh/ipcsneng/neng0172.html">http://www.cdc.gov/niosh/ipcsneng/neng0172.html</a> <a href="#">EXIT disclaimer &gt;</a>
<b>Secondary Contamination*</b>	Secondary contamination is possible through contact with contaminated surfaces, skin, clothes, etc.
<b>Diagnostic Tools</b>	Determine red blood cell cholinesterase activities. A chest X-ray may detect pulmonary edema if exposed via inhalation.

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### Medical Information By Exposure Route

<b>Ingestion</b>	
<b>Symptom Onset Time</b>	Within a few minutes or up to 12 hrs
<b>First Aid</b>	Rinse mouth, rest and refer for medical attention
<b>Treatment Available</b>	Yes
<b>Treatment Description</b>	After confirming malathion poisoning, administer activated charcoal in a slurry, perform gastric lavage (if within 1 hour of ingestion), suction oral secretions, commence atropine therapy, administer pralidoxime, benzodiazepine or phenobarbital to control seizures.
<b>Time Available for Effective Medical Intervention</b>	For high doses, immediate medical attention is necessary.

# Chemical Safety Card



## MALATHION

ICSC: 0172

<p>I M P O R T A N T D A T A</p>	<p><b>PHYSICAL STATE; APPEARANCE:</b> YELLOW TO BROWN LIQUID , WITH CHARACTERISTIC ODOUR.</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b> The substance decomposes on heating or on burning producing toxic fumes including phosphorus oxides and sulfur oxides . Reacts violently with strong oxidants . Attacks iron and some other metals, some forms of plastic and rubber. May form the more toxic isomalathion on heating.</p> <p><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV: 1 mg/m<sup>3</sup> as TWA; (skin); A4 (not classifiable as a human carcinogen); BEI issued; (ACGIH 2005). MAK: (Inhalable fraction) 15 mg/m<sup>3</sup>; Peak limitation category: II(4); Pregnancy risk group: D; (DFG 2005). OSHA PEL<sup>†</sup>: TWA 15 mg/m<sup>3</sup> skin NIOSH REL: TWA 10 mg/m<sup>3</sup> skin NIOSH IDLH: 250 mg/m<sup>3</sup> See: <a href="#">121755</a></p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation, through the skin and by ingestion.</p> <p><b>INHALATION RISK:</b> A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20°C ; on spraying or dispersing, however, much faster.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> The substance may cause effects on the central nervous system , resulting in convulsions and respiratory depression . The effects may be delayed. Medical observation is indicated.</p> <p><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> Repeated or prolonged contact may cause skin sensitization. Cholinesterase inhibitor; cumulative effect is possible: see acute hazards/symptoms.</p>
<p><b>PHYSICAL PROPERTIES</b></p>	<p>Boiling point at 0.093 kPa: 156-157°C Melting point: 3°C Relative density (water = 1): 1.2 Solubility in water: 145 mg/l Vapour pressure, Pa at 30°C: negligible</p>	<p>Relative vapour density (air = 1): 11.4 Relative density of the vapour/air-mixture at 20°C (air = 1): 1.00 Flash point: 163°C c.c. Octanol/water partition coefficient as log Pow: 2.89</p>
<p><b>ENVIRONMENTAL</b></p>	<p>The substance is very toxic to aquatic organisms. This substance may be hazardous to the environment; special attention should be given to honey bees. This substance does enter the environment under normal use. Great care, however, should be given to avoid any</p>	



# Medical Information - cont'd



## Medical Information By Exposure Route

Ingestion	
<b>Symptom Onset Time</b>	Dose-dependent; onset of symptoms may begin within 5 minutes.
<b>First Aid</b>	Inducing vomiting in conscious patients soon after poisoning is considered controversial because of the possibility of seizures or respiratory depression developing prior to or during treatment. Maintain airway and provide supportive care until treated in a hospital. If the patient has difficulty breathing or is unconscious, administer oxygen and begin cardiopulmonary resuscitation (CPR) as needed.
<b>Treatment Available</b>	Yes
<b>Treatment Description</b>	Rapid gastric lavage should be performed using 5% sodium bicarbonate (if within one hour of poisoning). Administer activated charcoal as a slurry. Provide patient support as needed including: suction of secretion, maintenance of airways, intravenous fluids if needed, administration of atropine, and bladder catheterization. Observe the patient for at least 24 hours to ensure that cholinergic symptoms do not recur.
<b>Time Available for Effective Medical Intervention</b>	Immediate medical attention would be necessary for a high dose. For non-lethal doses, medical observation should be continued for 24 hours following exposure.
<b>Time from Disease to Death</b>	3 hours for lethal dose
<b>Historical Mortality Rate</b>	Case Study: An incident of accidental poisoning occurred when three fishermen in Jamaica became critically ill within five minutes of eating a meal contaminated with methomyl. The men were taken to a hospital about three hours later and were pronounced dead upon arrival. The lethal doses were estimated at 12-15 mg/kg.
<b>Historical Morbidity Rate</b>	Case Study: Eleven patients who suffered methomyl poisoning were admitted to the intensive care unit. All of them showed cholinergic symptoms similar to that produced by organophosphorus insecticides but of lesser intensity. Plasma cholinesterase activity was normal in four patients and moderately lower in the remainder (all were above 32%). All of the patients showed miosis and none presented with a slow heartbeat. No complications were

# Medical and Toxicity Data



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CHECK ALL

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VIEW REFERENCES

**Contaminant Name: Malathion**

[VIEW GLOSSARY](#)

### General Medical Information

For information pertaining to personal protective equipment, please use the link to emergency response info when a link is provided.

<b>Subpopulations at Risk</b>	Young child (1yr) - young adolescent (16yr), Pregnant
<b>Prophylaxis Description</b>	-
<b>Link to Emergency Response Info</b>	<a href="http://www.cdc.gov/niosh/ipcsneng/neng0172.html">http://www.cdc.gov/niosh/ipcsneng/neng0172.html</a> <a href="#">EXIT disclaimer &gt;</a>
<b>Secondary Contamination*</b>	Secondary contamination is possible through contact with contaminated surfaces, skin, clothes, etc.
<b>Diagnostic Tools</b>	Determine red blood cell cholinesterase activities. A chest X-ray may detect pulmonary edema if exposed via inhalation.

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### Medical Information By Exposure Route

<b>Ingestion</b>	
<b>Symptom Onset Time</b>	Within a few minutes or up to 12 hrs
<b>First Aid</b>	Rinse mouth, rest and refer for medical attention
<b>Treatment Available</b>	Yes
<b>Treatment Description</b>	After confirming malathion poisoning, administer activated charcoal in a slurry, perform gastric lavage (if within 1 hour of ingestion), suction oral secretions, commence atropine therapy, administer pralidoxime, benzodiazepine or phenobarbital to control seizures.
<b>Time Available for Effective Medical Intervention</b>	For high doses, immediate medical attention is necessary.



# References



## Select Categories

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CHECK ALL

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HIDE REFERENCES

**Contaminant Name: Malathion**

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## General Medical Information

For information pertaining to personal protective equipment, please use the link to emergency response info when a link is provided.

<b>Subpopulations at Risk</b>	Young child (1yr) - young adolescent (16yr) <a href="#">HSDB</a> , Pregnant <a href="#">HSDB</a>
<b>Prophylaxis Description</b>	-
<b>Link to Emergency Response Info</b>	<a href="http://www.cdc.gov/niosh/ipcsneng/neng0172.html">http://www.cdc.gov/niosh/ipcsneng/neng0172.html</a> <a href="#">EXIT disclaimer</a> ▶
<b>Secondary Contamination</b>	Secondary contamination is possible through contact with contaminated surfaces, skin, clothes, etc. *
<b>Diagnostic Tools</b>	Determine red blood cell cholinesterase activities. A chest X-ray may detect pulmonary edema if exposed via inhalation. <a href="#">EMED39</a>

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## Medical Information By Exposure Route

<b>Ingestion</b>	
<b>Symptom Onset Time</b>	Within a few minutes or up to 12 hrs <a href="#">HSDB</a>
<b>First Aid</b>	Rinse mouth, rest and refer for medical attention <a href="#">HSDB</a>
<b>Treatment Available</b>	Yes <a href="#">HSDB</a>
<b>Treatment Description</b>	After confirming malathion poisoning, administer activated charcoal in a

# References - citations



WCIT References and Flags - Windows Internet Explorer

https://cdx.epa.gov/SSL/WCIT/Ref\_flag.cfm?ID=12694&Field=196&Key=520

**Contaminant Name: Malathion**

**Data Element**

<b>Data Element</b>	Acute Outcome
<b>Data Value</b>	Acute outcome include: Death, bradycardia, tachycardia (increase in heart rate), hypotension, severe respiratory distress, hypersalivation, miosis, mydriasis, increased lacrimation, pallor, tremors, seizures, and coma.

**Data Reference:**

Reference Code	Reference	Flag(s)
BKRMPP	Reigart, J. Routt, M.D. and James R. Roberts, M.D., M.P.H.. Recognition and Management of Pesticide Poisonings, Washington, D.C.: EPA, 1999.	
EMED39	eMedicine. Toxicity, Organophosphate. <a href="http://emedicine.medscape.com/article/167726-overview">http://emedicine.medscape.com/article/167726-overview</a> . 2009. <a href="#">EXIT disclaimer &gt;</a>	

Internet 100%

<b>Treatment Available</b>	Yes <a href="#">HSDb</a>
<b>Treatment Description</b>	After confirming malathion poisoning, administer activated charcoal in a slurry, perform gastric lavage (if within 1 hour of ingestion), suction oral secretions, commence atropine therapy, administer pralidoxime

# Reference Link



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## Organophosphate Toxicity

Author: Kenneth D Katz, MD, FAAEM, ABMT; Chief Editor: Michael R Pinsky, MD, CM, FCCP, FCCM [more...](#) [Print](#)

Overview Presentation **DDx** Workup Treatment Medication Follow-up

Updated: Mar 16, 2010

**Background**

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Organophosphate (OP) compounds are a diverse group of chemicals used in both domestic and industrial settings. Examples of organophosphates include insecticides (malathion, parathion, diazinon, fenthion, dichlorvos, chlorpyrifos, ethion), nerve gases (soman, sarin, tabun, VX), ophthalmic agents (echothiophate, isofluorophate), and antihelmintics (trichlorfon). Herbicides (tribufos [DEF], merphos) are tricresyl phosphate-containing industrial chemicals.

Organophosphate compounds were first synthesized in the early 1800s when Lassaigne reacted alcohol with phosphoric acid. Shortly thereafter in 1854, Philip de Clermont described the synthesis of tetraethyl pyrophosphate at a meeting of the French Academy of Sciences. Eighty years later, Lange, in Berlin, and Schrader, a chemist at Bayer AG, Germany, investigated the use

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# Toxicity Information



Exposure Route	Toxicity Measure	Value	Notes	Reference
Ingestion	LD <sub>50</sub>	53.00 mg/kg	Cattle (lowest mammalian LD <sub>50</sub> )	<a href="#">ChemIDplus</a>
	LD <sub>50</sub>	190.00 mg/kg	Mouse-reports show that rat ingestion at LD <sub>50</sub> is similar at 290 mg/kg - other LD50's have been reported	<a href="#">ChemIDplus</a>
	RfD	2.00 x 10 <sup>-2</sup> mg/kg-day	-	<a href="#">EPA IRIS</a>
	NOAEL	16.00 mg/kg	Effect: RBC ChE depression in a human subchronic feeding study	<a href="#">EPA IRIS</a>
	One-Day HA	0.20 mg/L	Study done in 1992	<a href="#">EPA 822-R-06-013</a>
	Ten-Day HA	0.20 mg/L	Study done in 1992	<a href="#">EPA 822-R-06-013</a>
	Life-time HA	0.10 mg/L	Study done in 1992	<a href="#">EPA 822-R-06-013</a>
Inhalation	AEGLs	15.00 mg/m <sup>3</sup>	AEGL 1. Applicable between 10 minutes and 8 hours.	<a href="#">EPA OPPT</a>
	LC <sub>Lo</sub>	10.00 mg/m <sup>3</sup>	Cat (1982). Lowest LCLo. Other toxicology studies are reported in the reference.	<a href="#">ChemIDplus</a>

# Drinking Water Treatment



Carbon adsorption - GAC	
<b>Drinking Water Treatment Performance</b>	Analyses of grab samples taken after the water had passed through the carbon cartridges showed no pesticide content above the minimum detectable concentrations of 25 mg/L for organophosphorus compounds, including malathion.
<b>Study Conditions Summary</b>	The study was carried out using a large, calibrated, rectangular stainless steel tank equipped with an agitator, a glass standpipe, and two completely separate low-flow activated carbon units. 1500 liters of tap water was placed in the tank and 2 µg/L of several different pesticides, including malathion were added. The entire solution was passed through two separate activated carbon cartridges (750 liters each) containing Nuchar C-190 fine carbon at a flow rate of 130 mL/min. Grab samples were taken at the beginning of each run in the tank and at the outlet.
<b>Process Performance Considerations</b>	The concentration of malathion was very low (2 µg/L) within the test water. Additionally, tap water was used which may not accurately indicate the effects of other chemicals or minerals in river or well water. Extraction of malathion from the carbon cartridge after 4 days was only 52%, indicating that some of the malathion may be permanently bound to the carbon, limiting the likeliness of carbon recharge and reuse.
<b>Contaminant Byproducts</b>	<ul style="list-style-type: none"> <li>No data found</li> </ul>
<b>Rating</b>	Highly Effective

# Wastewater Treatment



<b>Performance Rating</b>	Effective <a href="#">[EPA-600-S2-82-028]</a>
<b>Impacts on Process</b>	Malathion introduced into an alum coagulation/flocculation basin may require extended settling times for significant removal of malathion to occur. <a href="#">[EPA-600-S2-82-028]</a>

<b>Tertiary Treatment - Activated Carbon</b>	
<b>Wastewater Treatment Performance</b>	<ul style="list-style-type: none"> <li>Two sets of bench shaking tests achieved a 100% removal of malathion. <a href="#">[EPA-600-2-82-028]</a></li> <li>In a glass column test, the carbon had absorbed 0.17 g malathion/g carbon by the time the effluent malathion concentration reached 3 mg/L. The carbon was exhausted (that is, the effluent malathion concentration reached the influent concentration) after 0.28 g malathion/g carbon had been absorbed. In the pilot plant test, malathion was absorbed in the carbon columns to below detection limits. The carbon columns were not exhausted as only 20,000 liters of wastewater could be collected. It was estimated that 40,000 liters of wastewater would be required to exhaust the columns. <a href="#">[EPA-600-S2-82-028]</a></li> </ul>
<b>Summary of Study Conditions</b>	<ul style="list-style-type: none"> <li>Batch shaking tests were conducted for two hours with malathion concentrations of 5 to 10 mg/L and activated carbon concentration of 80 mg/L. A second two-hour batch shaking test was conducted with a malathion concentration of 25 mg/L and an activated carbon concentration of 140 mg/L. <a href="#">[EPA-600-2-82-028]</a></li> <li>Exhaustion tests were conducted to determine the capacity of activated carbon to absorb malathion from a solution with a concentration of 100 mg/L. Two tests were conducted: one using a small glass column containing 25 grams of carbon and a second pilot plant test with two 20 kg carbon columns in series. <a href="#">[EPA-600-S2-82-028]</a></li> </ul>
<b>Process Performance Considerations</b>	<ul style="list-style-type: none"> <li>The test was completed on a very small scale and the type or gradation of carbon is unknown. <a href="#">[EPA-600-2-82-028]</a></li> <li>The type or gradation of carbon is not discussed. <a href="#">[EPA-600-S2-82-028]</a></li> </ul>
<b>Byproducts or Treatment Residuals &amp; Notes</b>	<p><b>No data found:</b> <a href="#">[EPA-600-2-82-028]</a></p> <p><b>No data found:</b> <a href="#">[EPA-600-S2-82-028]</a></p>
<b>Performance Rating</b>	Highly Effective <a href="#">[EPA-600-2-82-028]</a>
<b>Impacts on Process</b>	<ul style="list-style-type: none"> <li>None expected <u>*</u></li> <li>None expected <u>*</u></li> </ul>

# User Feedback



- **User remarks:**

- “The features work well. The integration with NEMI-CBR enhancements to WCIT are outstanding.”

- Gary Lynch, Park Water Company, Downey, CA*

- “The team should be congratulated on excellent work! The WCIT gives us at the Utility level a wonderful tool that when combined with the EPA tool boxes, we are better equipped to handle scenarios. The tools will expedite initial response, plan for the proper analytical sampling, analysis, and decon in the event of the need.”

- Kevin Gertig, Fort Collins Utilities, Fort Collins, CO*

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- Register for WCIT at [http://cdx.epa.gov/epa\\_home.asp](http://cdx.epa.gov/epa_home.asp)
- For more information:
  - Contact the me at: [WCIT@epa.gov](mailto:WCIT@epa.gov)
- To log into WCIT
  - <https://cdx.epa.gov/SSL/cdx/login.asp>





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# Questions

