Pyrethroids

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• Intended Use

For detection of Permethrin and related pyrethroids (please refer to cross-reactivity table) in water (groundwater, surface water, well water). Please refer to the attached specific procedures for water (groundwater, surface water, well water). For soil, crop, and food use contact the company for application bulletins and/or specific matrix validation guidelines.

• Principle

The Abraxis Pyrethroid Assay applies the principles of enzyme linked immunosorbent assay (ELISA) to the determination of Permethrin and related pyrethroids. The sample to be tested is added, along with paramagnetic particles attached with antibodies specific to pyrethroids, to a disposable glass test tube, and incubated for 20 minutes. This is followed by the addition of an pyrethroid enzyme conjugate. Both the pyrethroids (which may be in the sample) and the enzyme labeled Permethrin analog (the enzyme conjugate) compete for antibody binding sites on the magnetic particles. At the end of a thirty minute (30) incubation period, a magnetic field is applied to hold the paramagnetic particles (with Pyrethroid and labeled Permethrin analog bound to the antibodies on the particles, in proportion to their original concentration) in the tube and allow the unbound reagents to be decanted. After decanting, the particles are washed with Washing Solution.

The presence of pyrethroids is detected by adding the enzyme substrate (hydrogen peroxide) and the chromogen (3,3',5,5'-tetramethylbenzidine). The enzyme-labeled Permethrin analog bound to the Pyrethroid antibody catalyzes the conversion of the substrate/ chromogen mixture to a colored product. After an incubation period of thirty (30) minutes, the reaction is stopped and stabilized by the addition of acid. Since the labeled Permethrin (conjugate) was in competition with the unlabeled Pyrethroids (sample) for the antibody sites, **the color developed is inversely proportional to the concentration of Pyrethroids in the sample**.

• Reagents

1. Pyrethroid Antibody Coupled Paramagnetic Particles
The Pyrethroid antibody (monoclonal anti-Permethrin) is bound to paramagnetic particles, which are suspended in buffered saline containing preservative and stabilizers.
100 test kit: one 60 mL vial

2. Pyrethroid Enzyme Conjugate
The horseradish peroxidase (HRP) labeled Permethrin analog is diluted in buffered saline containing preservative and stabilizers.
100 test kit: one 30 mL vial

3. Permethrin Standards
Five concentrations (0.75, 2.5, 5.0, 15.0 ppb) of Permethrin in a methanolic solution with preservative and stabilizers. Each vial contains 2.0 mL.

4. Control
A concentration (approximately 3.0 ppb) of Permethrin in a methanolic solution containing preservative and stabilizers. A 2.0 mL volume is supplied in one vial.

5. Diluent/Zero Standard
A methanolic solution containing preservative and stabilizers without any detectable Permethrin.
100 test kit: one 35 mL vial

6. Color Solution
A solution of hydrogen peroxide and 3,3',5,5'-tetramethylbenzidine in an organic base.
100 test kit: one 65 mL vial

7. Stopping Solution
A solution of diluted sulfuric acid (0.5%).
100 test kit: one 60 mL vial

8. Washing Solution
Preserved deionized water.
100 test kit: one 250 mL vial

9. Test Tubes
Glass tubes (36) are packed in a box.
100 test kit: three 36 tube boxes

• Reagent Storage and Stability

Store all reagents at 2-8°C. Do not freeze. Reagents may be used until the expiration date on the box. *The test tubes require no special storage condition and may be stored separately from the reagents to conserve refrigerator space.*

Consult state, local and federal regulations for proper disposal of all reagents.

• Materials Required but Not Provided

In addition to the reagents provided, the following items are essential for the performance of the test:

Pipets*	Precision pipets capable of delivering 250 and 500 uL and a 1.0 mL repeating pipet.
Vortex Mixer*	Thermolyne Maxi Mix, Scientific Industries Vortex Genie, or equivalent

Magnetic Separation Rack*

Photometric Analyzer* capable of readings at 450 nm

Methanol (HPLC Grade or equivalent).

* These items are available from Abraxis.

• Sample Information

This procedure is recommended for use with water samples. Other samples may require modifications to the procedure and should be thoroughly validated.

> Water samples should be collected in glass vessels (teflon liners in the cap). **Immediately** upon collection, samples should be diluted with an equal volume (1:1) of methanol (HPLC grade) to prevent adsorptive losses to the glass containers.

After samples are diluted, those samples containing gross particulate matter should be filtered (e.g. 0.2 um Anotop™ 25 Plus, Whatman, Inc.) to remove particles.

If the Pyrethroid concentration of a sample exceeds 15.0 ppb, the sample is subject to repeat testing using a diluted sample. A ten-fold or greater dilution of the sample is recommended with an appropriate amount of Diluent/Zero Standard or Sample Diluent. For example, in a separate test tube make a ten-fold dilution by adding 100 uL of the sample to 900 uL of Diluent/Zero Standard. Mix thoroughly before assaying. Perform the assay according to the Assay Procedure and obtain final results by multiplying the value obtained by the dilution factor e.g. 10.

The presence of the following substances up to 10,000 ppm were found to have no significant effect on the Pyrethroid Assay results: copper, manganese, calcium, magnesium, sodium, phosphate, sulfate, thiosulfate, and nitrate. Sodium Fluoride up to 1,000 ppm. Copper and $FeSO_4$ up to 100 ppm, and Humic acid up to 10 ppm was found to have no significant effect. In addition Sodium Chloride up to 1M was found to have no significant effect.

• Reagent Preparation

All reagents must be allowed to come to room temperature and the antibody coupled paramagnetic particles should be mixed thoroughly before use.

• Procedural Notes and Precautions

Prepare water samples as described above. Follow the assay procedure as described in the Assay Procedure section of this package insert.

As with all immunoassays, a consistent technique is the key to optimal performance. To obtain the greatest precision, be sure to treat each tube in an identical manner.

Add reagents directly to the bottom of the tube while **avoiding contact between the reagents and the pipet tip**. This will help assure consistent quantities of reagent in the test mixture.

Avoid cross-contaminations and carryover of reagents by using clean pipets for each sample addition and by avoiding contact between reagent droplets on the tubes and pipet tips.

Avoid foam formation during vortexing.

The magnetic separation rack consists of two parts: an upper rack which will securely hold the test tubes and a lower separator which contains the magnets used to attract the antibody coupled paramagnetic particles. During incubations the upper rack is removed from the lower separator so that the paramagnetic particles remain suspended during the incubation. **For separation steps, the rack and the separator are combined to pull the paramagnetic particles to the sides of the tubes**.

To obtain optimum assay precision, it is important to perform the separation steps carefully and consistently. Decant the rack by slowly inverting away from the operator using a smooth turning action so the liquid flows consistently along only one side of the test tube. While still inverted, place the rack on an absorbent pad and allow to drain. Lifting the rack and replacing gently onto the pad several times will ensure complete removal of the liquid from the rim of the tube.

Mix the antibody coupled paramagnetic particles just prior to pipetting.

> Standard and Control vials should remain capped when not in use, to prevent evaporation.

Do not use any reagents beyond their stated shelf life.

Avoid contact of Stopping Solution (sulfuric acid) with skin and mucous membranes. If this reagent comes in contact with skin, wash with water.

• Limitations

The Abraxis Pyrethroid Assay will detect Pyrethroids to different degrees. Refer to specificity table for data on various Pyrethroids. The Abraxis Pyrethroid Assay kit provides screening results. As with any analytical technique (GC, HPLC, etc...) positive results requiring some action should be confirmed by an alternative method.

The total time required for pipetting the magnetic particles should be kept to two (2) minutes or less, therefore the total number of tubes that can be assayed in a run should be adjusted accordingly.

• Quality Control

A control solution at approximately 3.0 ppb of Permethrin is provided with the Abraxis Pyrethroid Assay kit. It is recommended that it be included in every run and treated in the same manner as unknown samples. Acceptable limits should be established by each laboratory.

• Assay Procedure

Read Reagent Preparation, Procedural Notes and Precautions before proceeding.

1. Perform the appropriate sample preparation according to the attached water or soil procedure. For any other sample matrices refer to specific procedures available from Abraxis.

2. Label **glass** test tubes for standards, control, and samples.

Tube Number	Contents of Tube
1,2	Diluent/Zero Standard, 0 ppb
3,4	Standard 1, 0.75 ppb
5,6	Standard 2, 2.5 ppb
7,8	Standard 3, 5.0 ppb
9,10	Standard 4, 15.0 ppb
11	Control
12	Sample 1
13	Sample 2
14	Sample 3

3. Add 250 uL of the appropriate standard, control, or sample to the test tube.
4. Mix the Pyrethroid Antibody Coupled Paramagnetic Particles thoroughly and add 500 uL to each tube.
5. Vortex for 1 to 2 seconds minimizing foaming.
6. Incubate for 20 minutes at room temperature.
7. Add 250 uL of Pyrethroid Enzyme Conjugate to each tube.
8. Vortex for 1 to 2 seconds minimizing foaming.
9. Incubate for 30 minutes at room temperature.
10. Separate in the Magnetic Separation Rack for **two (2) minutes**.
11. Decant and **gently** blot all tubes briefly in a consistent manner.
12. Add 1 mL of Washing Solution to each tube and vortex tubes for 1-2 seconds. Return tubes and allow to remain in the magnetic separation unit for **two (2) minutes**.
13. Decant and **gently** blot all tubes briefly in a consistent manner.
14. Repeat Steps 12 and 13 an additional time.
15. Remove the rack from the separator and add 500 uL of Color Solution to each tube.
16. Vortex for 1 to 2 seconds minimizing foaming.
17. Incubate for 30 minutes at room temperature.
18. Add 500 uL of Stopping Solution to each tube.
19. Add 1 mL Washing Solution to a clean test tube. Use as blank in Step 20.
20. Read results at 450 nm within 15 minutes after adding the Stopping Solution.

• Results

Manual Calculations

1. Calculate the mean absorbance value for each of the standards.
2. Calculate the %B/Bo for each standard by dividing the mean absorbance value for the standard by the mean absorbance value for the Diluent/Zero Standard.
3. Construct a standard curve by plotting the %B/Bo for each standard on vertical Logit (Y) axis versus the corresponding Pyrethroid concentration on horizontal Ln (X) axis on the graph paper provided.
4. %B/Bo for controls and samples will then yield levels in ppb of Pyrethroid by interpolation using the standard curve.

(Contact Abraxis for detailed application information on specific photometers.)

Photometric Analyzer

Some instrument manufacturers make available photometers allowing for calibration curves to be automatically calculated and stored. Refer to the instrument operating manual for detailed instructions. To obtain results from the Abraxis Pyrethroid Assay on instruments allowing data transformation, the parameter settings given below are recommended.

Multiply the sample results by a factor of 2 to account for the initial 1:1 dilution of sample with methanol or alternatively program the Photometric Analyzer as listed below to automatically correct for the dilution factor.

Data Reduct	:	Lin. Regression
Xformation	:	Ln/Logit
Read Mode	:	Absorbance
Wavelength	:	450 nm
Units	:	PPB
# Rgt Blk	:	0
Calibrators:		
# of Cals	:	5
# of Reps	:	2
Concentrations:		
#1:	0.0	PPB
#2:	0.75	PPB
#3:	2.5	PPB
#4:	5.0	PPB
#5:	15.0	PPB
Range	:	0.75 – 15.0
Correlation	:	0.990
Rep. %CV	:	10%

• Expected Results

In a study with soil extracts, the Abraxis Pyrethroid Assay was shown to correlate well with GC.

• Performance Data

Precision

The following results were obtained:

Control	1	2	3
Replicates	5	5	5
Days	5	5	5
n	25	25	25
Mean (ppb)	0.95	3.7	7.9
% CV (within assay)	7.1	5.6	4.0
% CV (between assay)	9.7	8.2	10.1

Sensitivity

The Abraxis Pyrethroid Assay has an estimated minimum detectable concentration, based on a 90% B/Bo of 0.75 ppb.

Recovery

Five (5) groundwater samples, were spiked with various levels of Permethrin and then assayed using the Abraxis Pyrethroid Assay. The following results were obtained:

Amount of Permethrin Added (ppb)	Recovery Mean (ppb)	Recovery S.D. (ppb)	Recovery %
1.0	0.92	0.13	92
3.75	3.97	0.21	106
7.50	7.11	0.32	95
Average			98

Specificity

The cross-reactivity of the Abraxis Pyrethoid Assay for various Pyrethroid analogues can be expressed as the least detectable dose (LDD) which is estimated at 90% B/Bo, or as the dose required for 50% absorbance inhibition (50% B/Bo).

Compound	LDD (ppb)	50% B/Bo (ppb)
Permethrin	0.750	4.25
Cypermethrin	4.75	100
Lambda (λ) Cyhalothrin	9.2	89.5
Bifenthrin	13.5	150
Resmethrin	200	2,400
Cyfluthrin	220	3,400
Tetramethrin	> 1,000	> 10,000
3, PBA	170	1,700

The following compounds demonstrated no reactivity in the Abraxis Pyrethroid Assay at concentrations up to 1000 ppb: aldicarb, aldicarb sulfoxide, aldicarb sulfone, alachlor, atrazine, benomyl, butachlor, butylate, captan, carbaryl, carbendazim, carbofuran, 2,4-D, 1,3-dichloropropene, dinoseb, MCPA, metolachlor, metribuzin, pentachlorophenol, picloram, propachlor, terbufos, thiabendazole, and thiophanate-methyl.

• Assistance

For ordering or technical assistance contact:

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Email: customerservice@lifetechindia.com, www.atzlabs.com ; www.lifetechindia.com

• Ordering Information

Abraxis Pyrethroid Assay Kit, 100T	PN	500201
Pyrethroid Sample Diluent	PN	500202

• General Limited Warranty

Abraxis LLC warrants the products manufactured by the Company, against defects and workmanship when used in accordance with the applicable instructions for a period not to extend beyond the product's printed expiration date. **Abraxis makes no other warranty, expressed or implied. There is no warranty of merchantability or fitness for a particular purpose.**

R050206

PYRETHROIDS DETAILED FLOWCHART

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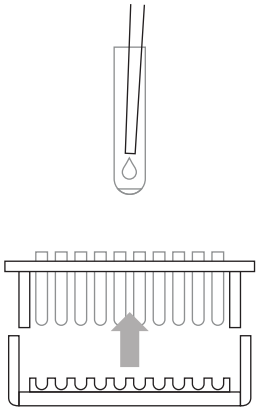
1.



Remove upper rack from magnetic base. Label test tubes for Standards, Control, and Samples.

Tube #	Content
1, 2	Diluent/Zero Standard 0 ppb
3, 4	Standard 1, 0.75 ppb
5, 6	Standard 2, 2.5 ppb
7, 8	Standard 3, 5.0 ppb
9, 10	Standard 4, 15.0 ppb
11	Control
12	Sample 1
13	Sample 2
14	Sample 3

Add 250 µL of either Standards, Control or Samples to the bottom of each test tube by inserting the pipette tip all the way into the bottom of the tube without touching the sides of the tube.

2.

Mix and *Add 500* µL of the Pyrethroid Antibody Coupled Paramagnetic Particles down the inside wall of each tube by aiming the pipet tip 1/4" to 1/2" below the tube rim without touching the rim or tube wall with the pipet tip; deliver liquid gently. *Vortex* for 1 to 2 seconds (at low speed to minimize foaming).

3.

React 20 minutes at room temperature (15 °- 30°C).

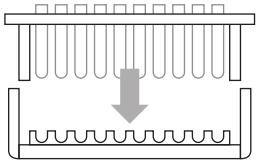
4.

Add 250 µL of Pyrethroid Enzyme Conjugate down the inside wall of each tube by using the technique described in Box 2. *Vortex* for 1 to 2 seconds (at low speed to minimize foaming).

5.

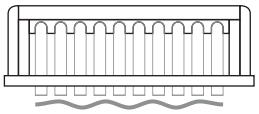
React 30 minutes at room temperature (15 °- 30°C).

6.



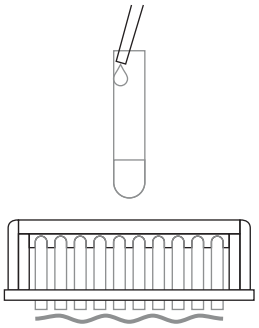
Combine the upper rack with the magnetic base; press all tubes into base; allow 2 minutes for the particles to separate.

7.



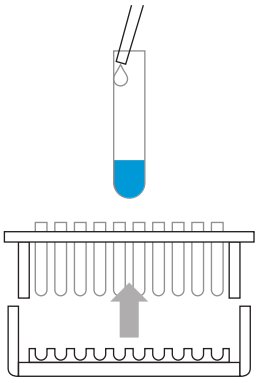
Do not separate upper rack from lower base. Using a smooth motion, *invert* the combined rack assembly over a sink and pour out the tube contents; keep inverted and **gently blot** the test tube rims on several layers of paper toweling.

8.



Add 1 mL of Washing Solution down the inside wall of each tube by using the technique described in Box 2. *Wait 2 minutes.* Using a smooth motion, invert the combined rack assembly over a sink and pour out the tube contents: keep inverted and **gently blot** the test tube rims on several layers of paper toweling. Repeat this step.

9.

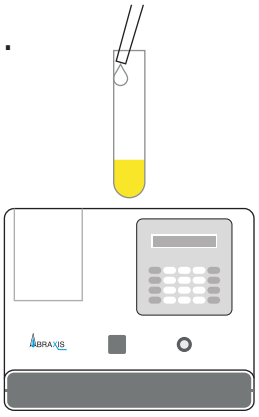


Lift the upper rack (with its tubes) off the magnetic base; *add* 500 µL of Color Reagent down the inside wall of each tube by using the technique described in Box 2. *Vortex* for 1 to 2 seconds (at low speed to minimize foaming).

10.

React for 30 minutes at room Temperature (15°- 30° C). During this period, add 1 mL of Washing Solution into a clean tube for use as an instrument blank in Step 10.

11.



Add 500 µL of Stopping Solution down the inside wall of each tube by using the technique previously Described. *Read* results at 450 nm within 15 minutes after adding the Stopping Solution. *Multiply* results of samples by the appropriate dilution factor (if any).

[**Safety Caution:** Stopping Solution contains diluted sulfuric acid.]

Pyrethoids Magnetic Particle Kit Part # 500201, 100 Test

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PYRETHROID CONCISE FLOWCHART

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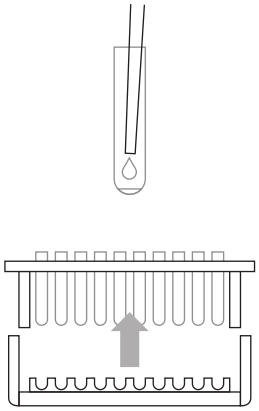
1.



Separate the rack.

Add 250 µL of standards, samples, and control.

2.

Add 500 µL of the Pyrethroid Antibody Coupled Paramagnetic Particles.

3.

Incubate for 20 minutes.

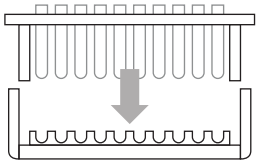
4.

Add 250 µL of mixed Pyrethroid Enzyme Conjugate to each test tube.

5.

Incubate for 30 minutes.

6.

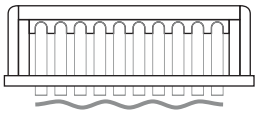


Combine the rack and magnetic base.

Seat all tubes.

Wait 2 minutes.

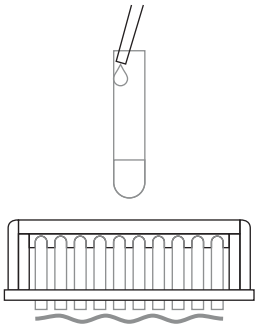
7.



Invert the combined rack.

Blot **gently**.

8.



Add 1 mL of Washing Solution.

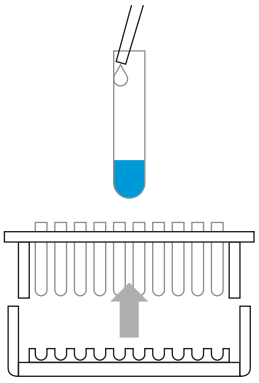
Wait 2 minutes.

Invert the combined rack.

Blot **gently**.

Repeat this step.

9.



Separate the rack.

Add 500 µL of Color Reagent to each test tube.

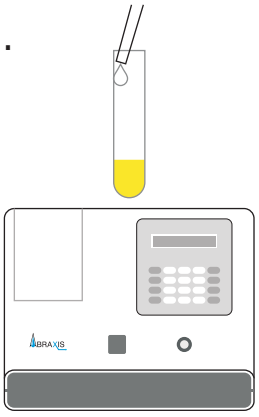
Vortex.

10.

*Incubate for 3*0 minutes.

Prepare blank.

11.



Add 500 µL of Stopping Solution to each test tube.

Read OD 450

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Pyrethoids Magnetic Particle Kit Part # 500201, 100 Test

ABRAXIS

Safety Data Sheet

Section 1: Product and Company Identification

1.1 Product Identifiers:
Product Name: Pyrethroids Magnetic Particle Kit
Product Code: 500201
1.2 Identified Use: Determination of Pyrethroids in samples. **Restrictions on Use:** For research use only.
1.3 Company: Abraxis, Inc.**,** 124 Railroad Drive**,** Warminster, PA 18974 USA**,** info@abraxiskits.com +1(215) 357-3911, FAX +1(215) 357-5232
1.4 Emergency Telephone Number: +1(215) 357-3911

Section 2: Hazard(s) Identification

2.1 Classification of the mixture:
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225 Highly flammable liquid and vapor
Acute toxicity, Oral (Category 3), H301 Toxic if swallowed
Acute toxicity, Inhalation (Category 3), H331 Toxic if inhaled
Acute toxicity, Dermal (Category 3), H311 Toxic in contact with skin
Specific target organ toxicity - single exposure (Category 1), H370 Causes damage to organs
HMIS Rating: Health hazard: 2, Chronic Health Hazard: *, Flammability: 3, Physical Hazard 0
NFPA Rating: Health hazard: 2, Fire Hazard: 3, Reactivity Hazard: 0
2.2 GHS Label elements, including precautionary statements:
Pictogram(s)

Signal word: Danger
Hazard statement(s):
H225 Highly flammable liquid and vapor.
H301 + H311 + H331 Toxic if swallowed, in contact with skin, or if inhaled
H370 Causes damage to organs.
Precautionary statement(s):
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/fume/gas/mist/vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/eye protection/face protection.
P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Rinse mouth.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician.
P307 + P311 If exposed: Call a POISON CENTER or doctor/physician.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS: None known.
2.4 Unknown acute toxicity: None known.

Section 3: Composition / Information on Ingredients

3.2 Mixtures: Mixture of the hazardous substance(s) listed below, with nonhazardous additions.

Hazardous component(s):
Name and Synonym(s): Methyl alcohol, MeOH, Methanol Formula: CH_4O Molecular weight: 32.04 g/mol
CAS No.: 67-56-1 EC-No.: 200-659-6
Classification: Flammable Liquid 2, Acute Toxicity 3; STOT SE 1; H225, H301 + H311 + H331, H370
Percentage in Mixture: 4 %
For full text of H-Statements mentioned in this Section, see Section 2.

Section 4: First Aid Measures

4.1 Description of first aid measures: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact: Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
4.2 Most important symptoms and effects, both acute and delayed: The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11
4.3 Indication of any immediate medical attention and special treatment needed: No data available. Treat symptomatically.

Section 5: Fire-fighting Measures

5.1 Suitable extinguishing media: Dry powder or sand **Unsuitable extinguishing media:** Do NOT use water jet
5.2 Special hazards arising from the substance or mixture: Carbon oxides
5.3 Advice for firefighters: Wear self-contained breathing apparatus for fire-fighting if necessary.
5.4 Further information: Use water spray to cool unopened containers.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures: Use personal protective equipment (see section 8). Avoid dust formation. Avoid breathing vapors, mist, dust, or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.
6.2 Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
6.3 Methods and materials for containment and cleaning up: Contain spillage. Solids (if applicable): Pick up and arrange disposal without creating dust. Sweep up and shovel. Liquids (if applicable): Absorb with non-combustible liquid-binding material (sand, earth, diatomite, vermiculite). Keep in suitable, closed containers for disposal.
6.4 Reference to other sections: For information on safe handling see section 7.
For information on personal protection see section 8.
For information on disposal see section 13.

Section 7: Handling and Storage

7.1 Precautions for safe handling: See section 2. Avoid inhalation of vapors or mist, and avoid contact with skin and eyes. Wear appropriate personal protective equipment. Use explosion-proof equipment. Keep away from sources of ignition. Do not eat, drink, or smoke in work area. Take measures to prevent the buildup of electrostatic charge.
7.2 Precautions for safe storage: Keep container(s) tightly closed in a dry, well-ventilated place. Protect from physical damage. Opened containers must be carefully resealed and kept upright to prevent leakage. See label or product insert for appropriate storage temperature and additional specific information. Storage class (TRGS 510): Flammable liquids.
7.3 Specific end use(s): Other than use(s) specified in section 1, no other uses are stipulated.

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters:
Component(s) with workplace control parameters
Methanol, CAS No. 67-56-1

Value	Control parameters	Basis
TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
Headache Nausea Dizziness Eye damage		

Substances for which there is a Biological Exposure Index or Indices (see BEI section) Danger of cutaneous absorption		
STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI section) Danger of cutaneous absorption		
TWA	200.000000 ppm; 260.000000 mg/m^3	USA. NIOSH Recommended Exposure Limits
Potential for dermal absorption		
ST	250.000000 ppm; 325.000000 mg/m^3	USA. NIOSH Recommended Exposure Limits
Potential for dermal absorption		
TWA	200.000000 ppm; 260.000000 mg/m^3	USA. Occupational Exposure Limits; (OSHA) - Table Z-1 Limits for Air Contaminants
The value in mg/m3 is approximate		
TWA	200 ppm; 260 mg/m^3	USA. NIOSH Recommended Exposure Limits
Potential for dermal absorption		
ST	250 ppm; 325 mg/m^3	USA. NIOSH Recommended Exposure Limits
Potential for dermal absorption		
TWA	200 ppm; 260 mg/m^3	USA. Occupational Exposure Limits; (OSHA) - Table Z-1 Limits for Air Contaminants
The value in mg/m3 is approximate		
STEL	250 ppm; 325 mg/m^3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
Skin notation		
TWA	200 ppm; 260 mg/m^3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
Skin notation		

Biological occupational exposure limits

Methanol, CAS No. 67-56-1

Parameters	Value	Biological specimen	Basis
Methanol	15.0000 mg/l	Urine	ACGIH – Biological Exposure Indices (BEI)
End of shift (As soon as possible after exposure ceases)			

Derived No Effect Level (DNEL)

Methanol, CAS No. 67-56-1

Application area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects, Acute systemic effects	40mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects, Acute systemic effects	8mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects, Acute systemic effects	8mg/kg BW/d
Workers	Inhalation	Acute systemic effects, Acute local effects, Long-term systemic effects, Long-term local effects	260 mg/m^3
Consumers	Inhalation	Acute systemic effects, Acute local effects, Long-term systemic effects, Long-term local effects	50 mg/m^3

Predicted No Effect Concentration (PNEC)

Methanol, CAS No. 67-56-1

Compartment	Value
Soil	23.5 mg/kg
Marine water	15.4 mg/l
Fresh water	154 mg/l
Fresh water sediment	570.4 mg/kg
Onsite sewage treatment plant	100 mg/kg

8.2 Exposure controls:
Appropriate engineering controls: Provide adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Keep away from food and beverages.
Personal protective equipment
Eye protection: Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).
Skin protection: Handle with chemical resistant gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Respiratory protection: Use a chemical fume hood or approved respiratory protection equipment.
Body protection: Lightweight, protective clothing to prevent skin exposure.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties of mixture
Appearance: Multiple
Odor: Characteristic
Odor Threshold: No data available
pH: Multiple
Melting point/freezing point: No data available
Initial boiling point and boiling range: No data available
Flash point: No data available
Evaporation rate: No data available
Flammability (solid, gas): No data available
Upper/lower flammability or explosive limits No data available
Vapor pressure: No data available
Vapor density: No data available
Relative density: No data available
Water solubility: Various
Partition coefficient: n-octanol/water: No data available
Auto-ignition temperature: Not applicable
Decomposition temperature: No data available
Viscosity: No data available
Explosive properties: No data available
Oxidizing properties: No data available
9.2 Other information: No data available

Section 10: Stability and Reactivity

10.1 Reactivity: No data available
10.2 Chemical stability: Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions: No data available
10.4 Conditions to avoid: Keep away from open flame, hot surfaces, heat sources, and sources of ignition.
10.5 Incompatible materials: Acid chlorides, acid anhydrides, strong oxidizing agents, alkali metals, reducing agents, acids, peroxides
10.6 Hazardous decomposition products: No data available. In the event of fire: see section 5.

Section 11: Toxicological Information

11.1 Information on toxicological effects
To the best of our knowledge, the chemical, physical, and toxicological properties of this product have not been thoroughly investigated.
Acute toxicity (Methanol, CAS No. 67-56-1)**:**

Inhalation LC50 Inhalation - Rat - 4 h - 128.2 mg/l; LC50 Inhalation - Rat - 6 h - 87.6 mg/l; LD50 Dermal - Rabbit - 17,100 mg/kg
Ingestion LDLO Oral - Human - 143 mg/kg (Lungs, Thorax, or Respiration:Dyspnea. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea); LD50 Oral - Rat - 1,187 - 2,769 mg/kg
Skin contact Rabbit skin—no irritation
Eye contact Rabbit eye—no irritation
Respiratory or skin sensitization Maximization Test (GPMT)(OECD Test Guideline 406)--Guinea pig--does not cause skin sensitization
Aspiration hazard No data available

Mutagenicity (Methanol, CAS No. 67-56-1)**:** Ames test (*S. typhimurium*)--Result: negative; *in vitro* assay (fibroblasts)--Result: negative; *in vivo* mammalian bone-marrow cytogenetic test, chromosomal analysis (mouse, male and female)--Result: negative

Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Teratogenicity: No data available
Reproductive/fertility toxicity: Damage to fetus not classifiable
Specific target organ toxicity, single exposure (Methanol, CAS No. 67-56-1)**:** Causes damage to organs
Specific target organ toxicity, repeated exposure: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Additional information (Methanol, CAS No. 67-56-1): RTECS: PC1400000 Effects due to ingestion may include headache, dizziness, drowsiness, metabolic acidosis, coma, seizures. Methanol may be fatal or cause blindness if swallowed. Stomach - Irregularities - Based on Human Evidence

Section 12: Ecological Information

12.1 Toxicity: No data available
12.2 Persistence and degradability: Readily biodegradable
12.3 Bioaccumulative potential: No data available
12.4 Mobility in soil: No data available
12.5 Results of PBT and vPvB assessment: No data available
12.6 Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13: Disposal Considerations

13.1 Waste treatment methods
Product: All waste must be handled and disposed according to local, state, and federal regulations. Avoid disposing large volumes in sewer.
Contaminated packaging: All waste must be handled and disposed according to local, state, and federal regulations.
Refer to sections 7 and 8 for safe handling guidance.

Section 14: Transport Information

DOT, Land Transport ADR/RID (cross-border), Maritime Transport IMDG, Air Transport ICAO-TI and IATA-DGR
UN Number: 3316
UN Proper shipping name: Chemical Kit, (contains Methanol)
Transport hazard class(es): 9
Packing group: III
Environmental hazard: See section 12
Bulk transport: Excepted/Limited quantity
Special considerations: See section 7 for handling

Section 15: Regulatory Information

EU Regulations, Hazard Symbol(s): Methanol: T (Toxic), F (Flammable)
Safety Phrases:
Methanol: S 7 / 16 / 36 / 37 / 45, Keep container tightly closed. Keep away from sources of ignition, no smoking. Wear suitable protective clothing and gloves. In case of accident or if you become ill, seek medical advice immediately (show product label).
SARA Title III, Section 313 Components: Methanol, CAS No. 67-56-1
SARA 311/312 Hazards: Methanol, CAS No. 67-56-1: Fire Hazard, Acute Health Hazard, Chronic Health Hazard
State Right-to-Know
Massachusetts: Methanol, CAS No. 67-56-1
Pennsylvania: Methanol, CAS No. 67-56-1
New Jersey: Methanol, CAS No. 67-56-1
California Prop. 65 Components: WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol, CAS No. 67-56-1

Section 16: Other information

This information is based on our present knowledge. While Abraxis , Inc. believes that the data contained herein are factual and the opinions expressed represent a best effort to present accurate information, the data are not to be taken as a warranty or representation for which Abraxis , Inc. assumes legal responsibility. The information shall not be taken as being all-inclusive and is to be used only as a guide. The data are offered solely for the user's consideration, investigation, and verification. These suggestions should not be confused with either state, municipal, or insurance requirements, or with national safety codes and constitute no warranty. Any use of these data and information must be determined by the user to be in accordance with applicable federal, state, and local regulations.

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