OP/Carbamate

Life Technologies™
Your Molecular & Cell Technology Partner

• Intended Use

For the detection of a wide range of organophosphate (including thiophosphate), and carbamate pesticides in water, (drinking water, ground water, surface water and well water). This assay can also be used for testing these compounds collected as dislodgeable residues from a surface wash, as well as pesticide residues prepared as a dry extract (please contact Abraxis technical support for information).

• Principle

The test is a qualitative, colorimetric assay (modification of the Ellman method) for the detection of organophosphates and carbamates, based on a modification of their inhibition of the enzyme Acetyl Cholinesterase (ACh-E). Ach-E hydrolyzes acetylthiocholine (ATC) which reacts with 5,5'-Dithio-bis(2-Nitrobenzoic Acid) [DTNB] to produce a yellow color which is read at 405 nm. If OP or Carbamate pesticides are present in a sample, they will inhibit ACh-E and therefore the color formation will be reduced or absent depending on their concentration.

Detection limits of the various OP/C pesticides differ depending on their ability to inhibit the enzyme (refer to Sensitivity table). If it has been established that only a single OP/C is present, the test can be used in conjunction with appropriate standards for quantitative testing.

• Reagents

The Abraxis OP/Carbamate Kit contains the following items:

(1) 20 Polystyrene test tubes (white caps), containing 500 ul of assay buffer. **ASSAY TUBES.**
(2) 1 test tube (blue cap), used as **NEGATIVE (-) CONTROL** and as a substate (ATC) diluent, 5 ml.
(3) 1 test tube (green cap), used as diluent for the lyophilized ACh-E, 3ml.
(4) Pesticide **(+) POSITIVE CONTROL (**amber vial), 1 ml.
(5) **OXIDIZER (**ambervial), 1 ml.
(6) Oxidizer Diluent (orange cap dropper bottle), 1.8 ml of assay buffer.
(7) **NEUTRALIZER** (red cap dropper bottle), 2ml.
(8) **Ach-E**, lyophilized (green cap dropper bottle)
(9) **SUBSTRATE**, ATC, lyophilized (blue cap dropper bottle).
(10) **CHROMOGEN** (DTNB) (yellow cap dropper bottle), 2ml.
(11) **STOPPING SOLUTION** (purple cap dropper bottle), 2 ml.
(12) 100 ul exact volume pipettes, 22 each.
(13) 3 ml transfer pipets, 2 each.
(14) Work station box (WSB).

• Reagent Storage and Stability

Store all reagents at 2-8°C. Reagents may be used until the expiration date on the box.

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:

Photometer* capable of readings at 405-450 nm

* Please contact Abraxis for supplier information.

• Sample Information

This procedure is recommended for use with water samples. Other samples may require modifications to the procedure and should be thoroughly validated (contact Abraxis Technical support for information and guidance).

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

Samples may be prepared as dry extracts (solvent evaporated residues) or as residues dislodged from surface washes (see Sample Preparation under Assay Procedure). Other samples may require modifications to the procedure and should be validated.

Pigmented samples may obscure color and cause some interferences, therefore the negative control should be prepared in a similar matrix.

• Reagent Preparation

All reagents must be allowed to come to room temperature.

(1) **ACh-E** – Using a 3ml transfer pipet, remove 2 ml from the green cap test tube and add to the green cap dropper bottle by removing the green cap and dropper tip. After adding the 2 ml into the bottle put back the dropper tip and green cap on the bottle and mix by shaking moderately. Allow at least 5 minutes for the ACh-E to go into solution before use in the assay.

(2) **Oxidizer** – Using a 100 ul volume pipet, remove 200 ul (2 X 100 uL) of oxidizer from the amber vial and add to the orange cap dropper bottle by removing the orange cap and dropper tip. After adding the 200 ul into the bottle, put back the dropper tip and orange cap on the bottle and mix by shaking moderately. **This diluted oxidizer must be made fresh for each assay**. If additional diluted oxidizer needs to be prepared, dispense 2 mL of solution from the **negative control** tube using the transfer pipette, and 200 uL of the concentrated **Oxidizer** using the 100 uL exact volume pipettes (2 shots).

(3) **Substrate** (ATC) – Using a 3ml transfer pipet remove, 2 ml from the blue cap test tube, add to the blue cap dropper bottle by removing the blue cap and dropper tip. After adding the 2 ml into the bottle put back the dropper tip and blue cap on the bottle and mix by shaking moderately.

• Procedural Notes and Precautions

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

Proper usage of 100 ul exact volume pipette— Squeeze the top bulb of the exact volume pipet and place the tip into the sample solution. Release the top bulb and the sample will be drawn into the pipet, any overflow sample will go into the middle bulb. Remove the pipet from the sample and transfer to assay tube by squeezing the top bulb to deliver the 100 ul sample (contained in the tip of the pipette). **Note:** Be careful not to allow the sample in the overflow bulb to be delivered with the 100 ul sample.

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. When using the dropper bottle , invert so the dropper tip is into the assay test tube as far as possible. Squeeze the bottle so that 2 drops of reagent fall into the bottom of assay tube. Avoid drops falling onto side of assay tube.

If performing assay outdoors, **avoid direct sunlight**.

Do not use any reagents beyond their stated shelf life.

Avoid contact of reagents with skin and mucous membranes. If a reagent comes in contact with skin, wash with water.

Operators wearing heavy personal protection equipment such as heavy butyl gloves, etc. should use micropipette dispensers with disposable tips to dispense standards/samples and assay reagents (2 drops are equivalent to 80 uL).

• Limitations

The Abraxis OP/Carbamate Assay will detect organo-phosphates and carbamates to different degrees. Refer to specificity table for data . The Abraxis OP/Carbamate 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.

• Quality Control

A high positive pesticide control is provided with the Abraxis OP/Carbamate Assay kit. The positive is 5 ppb of Diazinon in DI water. 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. Label test tubes for controls, and samples. Place assay tubes into Work Station Box (WSB) and remove white caps, discard the caps.

Tube Number	Contents of Tube
1,2	Negative Control
3,4	Positive Control
5,6	Sample 1
7,8	Sample 2
9,10	Sample 3
11,12	Sample 4
13,14	Sample 5
15,16	Sample 6

2 Using the supplied pippetes, add 100 uL of the appropriate **control, or sample** into designated assay tubes, shake WSB to mix.
3. Add 2 drops of **Oxidizer** (orange cap dropper bottle) into assay tubes,shake WSB to mix. Incubate 5 minutes at 70º F +/- 20 degrees
4. Add 2 drops of **Neutralizer** (red cap dropper bottle) into assay tubes,shake WSB to mix.
5 Add 2 drops of **Ach-E** (green cap dropper bottle) into assay tubes, shake WSB to mix. Incubate 15-30 minutes at 70° F +/- 20 degrees
6. Add 2 drops of **Substrate-**ATC (blue cap dropper bottle) into assay tubes, shake WSB to mix.
7. Add 2 drops of **Chromogen** – DTNB (yellow cap dropper bottle) into assay tubes, shake WSB to mix. Incubate 15-30 minutes at 70° F +/- 20 degrees
8. Add 2 drops of **Stopping Solution** (purple cap dropper bottle) into assay tubes, shake WSB to mix. Read at 405 nm (optimum wavelength) or 450 nm.

• Results

The negative control and any sample that has no detectable organophosphate or carbamate will develop a dark yellow color. Any sample with a detectable organophosphate or carbamate residue will have a reduced color development compared to the negative control. A 20% inhibition of color indicates the presence of a organophosphate or carbamate at or above the limit of detection (please refer to sensitivity table)

NOTE: If the negative control does not result in a yellow color, the test is invalid and should be repeated.

Limit of Detection Pattern (Sensitivity)-OP

Limit of Detection of the Abraxis OP/Carbamate Test is estimated at 20% (IC 20) inhibition of color development.

Compound	**Water**
Organophosphate	**PPB**
Azinphos methyl	**0.8**
Chlorpyrifos methyl	**1.0**
Chlorpyrifos ethyl	**1.3**
Diazinon	**1.0**
Dichlorvos	**0.5**
Dicrotophos	**20**
Disulfoton	**25**
Ethion	**3.9**
Malathion	**1.4**
Parathion	**1.0**
Phorate	**4.0**
Phosmet	**0.7**

Limit of Detection Pattern-Carbamates

Limit of Detection of the Abraxis OP/Carbamate Test is estimated at 20% (IC 20) inhibition of color development.

Carbamates	PPB
Aldicarb	**10**
Carbaryl	**160**
Carbofuran	**1.2**

• Ordering information

Abraxis OP/Carbamate Assay Kit 20T

PN 550051

• Assistance

For ordering or technical assistance contact:

India Contact:
Life Technologies (India) Pvt. Ltd.
306, Aggarwal City Mall, Road No. 44, Pitampura, Delhi – 110034, India
Mobile: +91-98105-21400, Tel: +91-11-42208000, 8111, 8222, Fax: +91-11-42208444
Email: customerservice@lifetechindia.com, www.atzlabs.com ; www.lifetechindia.com

Tel.: (215) 357-3911
Fax: (215) 357-5232
Email: info@abraxiskits.com

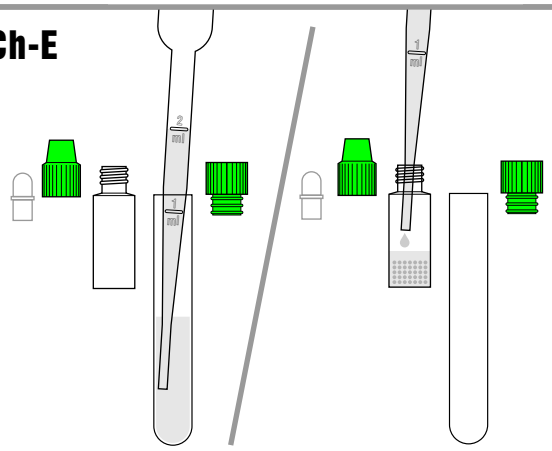
WEB: www.abraxiskits.com

3000070 *R1111410*

Organophosphate / Carbamate Screen Test

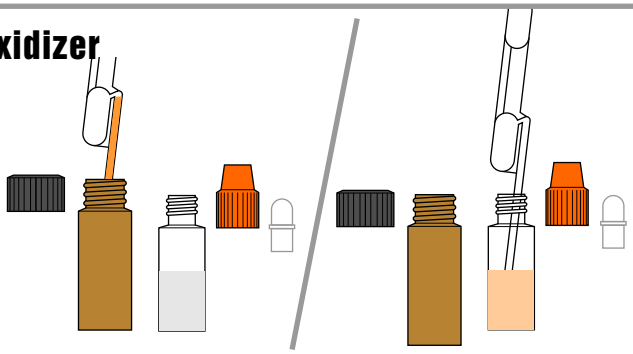
REAGENT PREPARATION

A ACh-E



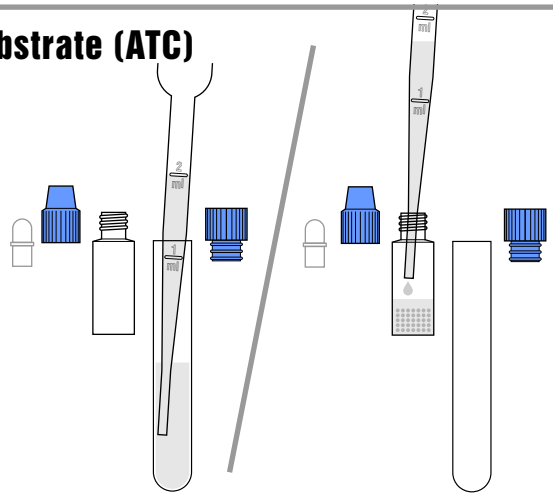
Reagent Preparation
All reagents must be allowed to come to room temperature.
Using a 3ml transfer pipet, remove 2 ml from the green cap test tube and add to the green cap dropper bottle by removing the green cap and dropper tip. After adding the 2 ml into the bottle put back the dropper tip and green cap on the bottle and mix by shaking moderately. Allow at least 5 minutes for the Ach-E to go into solution before use in the assay.

B Oxidizer



Using a 100 ul volume pipet, remove 200 ul (2 X 100 uL) of oxidizer from the amber serum vial and add to the orange cap dropper bottle by removing the orange cap and dropper tip. After adding the 200 ul into the bottle, put back the dropper tip and orange cap on the bottle and mix by shaking moderately.

C Substrate (ATC)



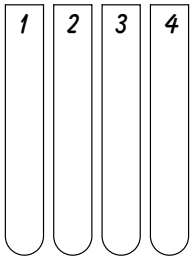
(3) Substrate (ATC) Using a 3ml transfer pipet remove, 2 ml from the blue cap test tube, add to the blue cap dropper bottle by removing the blue cap and dropper tip. After adding the 2 ml into the bottle put back the dropper tip and blue cap on the bottle and mix by shaking moderately.

India Contact:
Life Technologies (India) Pvt. Ltd.
306, Aggarwal City Mall, Road No. 44, Pitampura, Delhi – 110034, India
Mobile: +91-98105-21400, Tel: +91-11-42208000, 8111, 8222, Fax: +91-11-42208444
Email: customerservice@lifetechindia.com, www.atzlabs.com ; www.lifetechindia.com

ASSAY PROCEDURE

1.

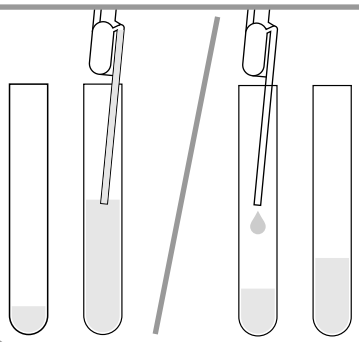
Read Reagent Preparation, Procedural Notes and Precautions before proceeding.
Label test tubes for controls, and samples. Place assay tubes into work station box and remove and discard the white caps.



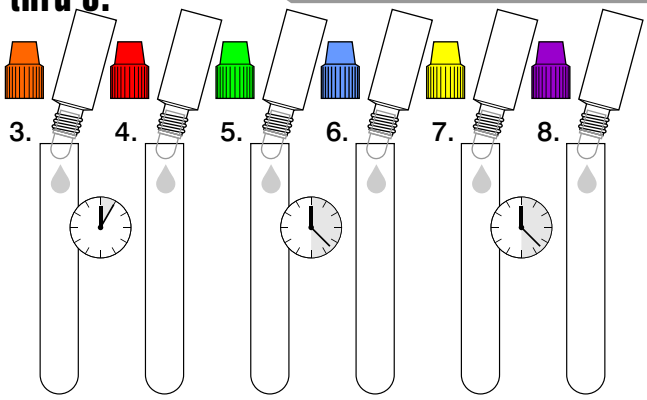
Tube Number	Contents of Tube
1,2	Negative Control
3,4	Positive Control
5,6	Sample 1
7,8	Sample 2
9,10	Sample 3
11,12	Sample 4
13,14	Sample 5
15,16	Sample 6

2.

Add 100 uL of the appropriate control, or sample into designated assay tubes, shake work station box to mix.

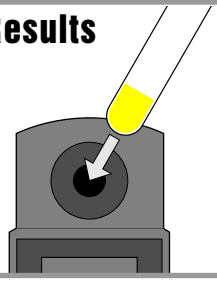


3. thru 8.

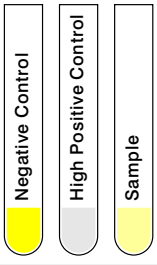


3. Add 2 drops of Oxidizer (orange cap dropper bottle) into assay tubes,shake work station box to mix. Incubate at least 5 minutes at 70° F +/- 20 degrees.
4. Add 2 drops of Neutralizer (red cap dropper bottle) into assay tubes, shake work station box to mix.
5. Add 2 drops of Ach-E (green cap dropper bottle) into assay tubes, shake work station box to mix. Incubate 15 to 30 minutes at 70° F +/- 20 degrees.
6. Add 2 drops of Substrate-ATC (blue cap dropper bottle) into assay tubes, shake work station box to mix.
7. Add 2 drops of Chromogen DTNB (yellow cap dropper bottle) into assay tubes, shake work station box to mix. Incubate 15 to 30 minutes at 70° F +/- 20 degrees.
8. Add 2 drops of Stopping Solution (purple cap dropper bottle) into assay tubes, shake work station box to mix. Read at 405 nm (optimum wavelength) or 450 nm.

Results



OR



Safety Data Sheet

Section 1: Product and Company Identification

1.1 Product Identifiers:
Product Name: Organophosphate/Carbamate (OP/C) Tube Kit
Product Code: 550051
1.2 Identified Use: Determination of Organophosphate/Carbamate (OP/C) 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: Not a hazardous mixture.
2.2 GHS Label elements, including precautionary statements: Not applicable.
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: *Contains no hazardous ingredients at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200)*, however it contains minor amounts of materials considered hazardous. We recommend handling all substances with caution.

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. 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: 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: No data available
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: Use an extinguishing agent suitable for the surrounding fire.
5.2 Special hazards arising from the substance or mixture: None known
5.3 Advice for firefighters: Wear self-contained breathing apparatus for fire-fighting if necessary.
5.4 Further information: No data available

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. 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: Solids (if applicable): Pick up and arrange disposal without creating dust. Sweep up and shovel. Liquids (if applicable): Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust). 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 and contact with skin and eyes. Wear appropriate personal protective equipment. Do not eat, drink, or smoke in work area.
7.2 Precautions for safe storage: Keep container(s) tightly closed in a dry, well-ventilated place. Protect from physical damage. See label or product insert for appropriate storage temperature and additional specific information.

7.3 Specific end use(s): No data available

Section 8: Exposure Controls / Personal Protection

8.1 Control parameters: Not applicable.
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: The usual precautionary measures, including eye/face/skin protection, should be taken when handling any chemical. Avoid contact with eyes, skin, and clothing.
Eye protection: As with handling of any chemical, wear approved safety goggles.
Skin protection: Handle with gloves. No specific information regarding glove material or thickness is available, but gloves must be impermeable and resistant to the substance being handled. 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: As with any chemical, where excessive vapor, mist, or dust may result, use a chemical fume hood or approved respiratory protection equipment.
Body protection: Lightweight, protective clothing.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties of the 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: No data available
10.5 Incompatible materials: No data available
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
Acute toxicity: Not available. To the best of our knowledge, the chemical, physical, and toxicological properties of this product have not been thoroughly investigated.
Inhalation: No data available **Ingestion:** No data available **Skin contact:** Irritant to skin and mucous membranes.
Eye contact: May cause eye irritation in susceptible persons. **Respiratory or skin sensitization:** No data available
Aspiration hazard: No data available **Mutagenicity:** No data available

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: No data available
Specific target organ toxicity, single exposure: No data available
Specific target organ toxicity, repeated exposure: No data available

Section 12: Ecological Information

12.1 Toxicity: No data available
12.2 Persistence and degradability: No data available
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

UN Number: Not regulated
UN Proper shipping name: Not classified as dangerous in the meaning of transport regulations.
Transport hazard class(es): No data available
Packing group: No data available
Environmental hazard: No data available
Bulk transport: No data available
Special considerations: No data available

Section 15: Regulatory Information

To the best of our knowledge, this product contains no substances which, at their given concentrations, are considered hazardous by other regulatory agencies. Refer to section 3.

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.

All materials and mixtures may present unknown hazards and should be used with caution. Since Abraxis , Inc. cannot control the methods, volumes, or conditions of use of this product, Abraxis , Inc. shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. An individual technically qualified to handle potentially hazardous chemicals must supervise the use of this material. This product is sold for research use only. It is not for any human or animal therapeutic or clinical diagnostic use.

Date this SDS was prepared: 5/24/2016
Version: 2
Changes from previous version: Abraxis, LLC changed to Abraxis, Inc.