

# SAFETY DATA SHEET



NMR Sample Kit - Direct Detect, Part Number 190350513

## Section 1. Identification

This product is considered an article. This Material Safety Data Sheet is written based on the encapsulated substance or mixture in this article.

### 1.1 Product identifier

**Product name** : NMR Sample Kit - Direct Detect, Part Number 190350513  
**Part No. (Chemical Kit)** : 190350513  
**Part No.** : 19F S/N 190350682  
 15N S/N 190350683  
 31P S/N 190350687  
 13C Sensitivity 190350616

**Validation date** : 02/25/2014.

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Material uses** : Analytical chemistry.  
 4 x 250 µl  
 19F S/N 250 µl  
 15N S/N 250 µl  
 31P S/N 250 µl  
 13C Sensitivity 250 µl

### 1.3 Details of the supplier of the safety data sheet

**Supplier/Manufacturer** : Agilent Technologies, Inc.  
 Logistics Center - Americas  
 500 Ships Landing Way  
 New Castle, Delaware 19720  
 800-227-9770

### 1.4 Emergency telephone number

**In case of emergency** : CHEMTREC®: 1-800-424-9300

## Section 2. Hazards identification

This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product's directions for use it may present potential health and safety hazards.

### 2.1 Classification of the substance or mixture

<b>OSHA/HCS status</b> : 19F S/N	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
15N S/N	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
31P S/N	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
13C Sensitivity	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

### Classification of the substance or mixture

## Section 2. Hazards identification

Not classified.

<b>Ingredients of unknown toxicity</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	Not applicable. Not applicable. Not applicable. Not applicable.
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### 2.2 GHS label elements

**Hazard pictograms**



<b>Signal word</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	Danger Danger Warning Danger
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**Hazard statements** :

**Precautionary statements**

**Prevention** :

**Response** :

**Storage** :

**Disposal** :

<b>Supplemental label elements</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	Avoid contact with skin and clothing. Wash thoroughly after handling. None known. None known. Avoid contact with skin and clothing. Wash thoroughly after handling.
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### 2.3 Other hazards

<b>Hazards not otherwise classified</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	Defatting to the skin. Prolonged or repeated contact may dry skin and cause irritation. None known. None known. Prolonged or repeated contact may dry skin and cause irritation.
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## Section 3. Composition/information on ingredients

This article, when used under reasonable conditions and in accordance with the directions for use, should not present a health hazard. The substance or mixture is encapsulated in the article. Only if released due to use or processing of the article in a manner not in accordance with the product's directions for use it may present potential health and safety hazards.

<b>Substance/mixture</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	Mixture Mixture Mixture Mixture
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## Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	60 - 100	1076-43-3
<b>15N S/N</b> Formamide di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	60 - 100 5 - 10	75-12-7 2206-27-1
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform Triphenyl phosphate	60 - 100 1 - 5	865-49-6 115-86-6
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform Ethylbenzene	60 - 100 5 - 10	865-49-6 100-41-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.**

**Occupational exposure limits, if available, are listed in Section 8.**

## Section 4. First aid measures

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	: 19F S/N	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
	15N S/N	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
	31P S/N	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
	13C Sensitivity	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
<b>Inhalation</b>	: 19F S/N	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie,

## Section 4. First aid measures

15N S/N

belt or waistband.

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

31P S/N

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

13C Sensitivity

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

## Section 4. First aid measures

<b>Skin contact</b>	: 19F S/N	Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	15N S/N	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	31P S/N	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	13C Sensitivity	Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	: 19F S/N	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	15N S/N	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	31P S/N	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is

## Section 4. First aid measures

13C Sensitivity

conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

### 4.2 Most important symptoms/effects, acute and delayed

#### Potential acute health effects

##### Eye contact

: 19F S/N  
15N S/N  
31P S/N  
13C Sensitivity

Causes serious eye irritation.  
Causes serious eye irritation.  
Causes serious eye irritation.  
Causes serious eye irritation.

##### Inhalation

: 19F S/N  
  
15N S/N  
  
31P S/N  
  
13C Sensitivity

Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.  
Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.  
Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

##### Skin contact

: 19F S/N  
15N S/N  
31P S/N  
13C Sensitivity

Causes skin irritation. Defatting to the skin.  
No known significant effects or critical hazards.  
Causes skin irritation.  
Causes skin irritation. Defatting to the skin.

## Section 4. First aid measures

<b>Ingestion</b>	: 19F S/N	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.
	15N S/N	Irritating to mouth, throat and stomach.
	31P S/N	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.
	13C Sensitivity	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

### Over-exposure signs/symptoms

<b>Eye contact</b>	: 19F S/N	Adverse symptoms may include the following: pain or irritation watering redness
	15N S/N	Adverse symptoms may include the following: pain or irritation watering redness
	31P S/N	Adverse symptoms may include the following: pain or irritation watering redness
	13C Sensitivity	Adverse symptoms may include the following: pain or irritation watering redness

<b>Inhalation</b>	: 19F S/N	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	15N S/N	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	13C Sensitivity	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness



## Section 4. First aid measures

<b>Skin contact</b>	: 19F S/N	Adverse symptoms may include the following: irritation redness dryness cracking
	15N S/N	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N	Adverse symptoms may include the following: irritation redness
	13C Sensitivity	Adverse symptoms may include the following: irritation redness dryness cracking
<b>Ingestion</b>	: 19F S/N	No specific data.
	15N S/N	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N	No specific data.
	13C Sensitivity	No specific data.

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

<b>Notes to physician</b>	: 19F S/N	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	15N S/N	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	31P S/N	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	13C Sensitivity	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Specific treatments</b>	: 19F S/N	No specific treatment.
	15N S/N	No specific treatment.
	31P S/N	No specific treatment.
	13C Sensitivity	No specific treatment.
<b>Protection of first-aiders</b>	: 19F S/N	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
	15N S/N	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person



## Section 4. First aid measures

31P S/N

providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

13C Sensitivity

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

#### Suitable extinguishing media

: 19F S/N  
15N S/N  
31P S/N

Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam. Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam. Use an extinguishing agent suitable for the surrounding fire.

13C Sensitivity

Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.

#### Unsuitable extinguishing media

: 19F S/N  
15N S/N  
31P S/N  
13C Sensitivity

Do not use water jet.  
Do not use water jet.  
None known.  
Do not use water jet.

### 5.2 Special hazards arising from the substance or mixture

#### Specific hazards arising from the chemical

: 19F S/N

Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

15N S/N

Combustible liquid. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

31P S/N

In a fire or if heated, a pressure increase will occur and the container may burst.

13C Sensitivity

Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard.

#### Hazardous thermal decomposition products

: Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
sulfur oxides  
halogenated compounds  
carbonyl halides

## Section 5. Fire-fighting measures

### 5.3 Advice for firefighters

<b>Special protective actions for fire-fighters</b>	: 19F S/N	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
	15N S/N	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
	31P S/N	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
	13C Sensitivity	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
<b>Special protective equipment for fire-fighters</b>	: 19F S/N	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	15N S/N	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	31P S/N	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	13C Sensitivity	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

## Section 6. Accidental release measures

<b>6.2 Environmental precautions</b>	: 19F S/N	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	15N S/N	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	31P S/N	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	13C Sensitivity	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### 6.3 Methods and materials for containment and cleaning up

19F S/N	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
15N S/N	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
31P S/N	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
13C Sensitivity	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

<b>Protective measures</b>	: 19F S/N	Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use
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## Section 7. Handling and storage

15N S/N

away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container.

31P S/N

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

13C Sensitivity

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic

## Section 7. Handling and storage

discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

<b>Advice on general occupational hygiene</b>	: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.	
<b>7.2 Conditions for safe storage, including any incompatibilities</b>	: 19F S/N	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
	15N S/N	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
	31P S/N	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
	13C Sensitivity	Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid

## Section 7. Handling and storage

environmental contamination.

### 7.3 Specific end use(s)

<b>Recommendations</b>	: 19F S/N	Industrial applications, Professional applications.
	: 15N S/N	Industrial applications, Professional applications.
	: 31P S/N	Industrial applications, Professional applications.
	: 13C Sensitivity	Industrial applications, Professional applications.
<b>Industrial sector specific solutions</b>	: Not applicable.	

## Section 8. Exposure controls/personal protection

Since the hazardous ingredient in this article is encapsulated, the risk of exposure by inhalation, ingestion, skin contact and eyes contact is minimum.

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<b>19F S/N</b> <sup>2</sup> H <sub>6</sub> Benzene	<b>ACGIH TLV (United States, 3/2012).</b> <b>Absorbed through skin.</b> TWA: 0.5 ppm 8 hours. TWA: 1.6 mg/m <sup>3</sup> 8 hours. STEL: 2.5 ppm 15 minutes. STEL: 8 mg/m <sup>3</sup> 15 minutes. <b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 1 ppm 8 hours. STEL: 5 ppm 15 minutes. <b>OSHA PEL Z2 (United States, 11/2006).</b> TWA: 10 ppm 8 hours. CEIL: 25 ppm AMP: 50 ppm 10 minutes. <b>NIOSH REL (United States, 6/2009).</b> TWA: 0.1 ppm 10 hours. STEL: 1 ppm 15 minutes. <b>OSHA PEL (United States, 6/2010).</b> TWA: 1 ppm 8 hours. STEL: 5 ppm 15 minutes.
<b>15N S/N</b> Formamide	<b>ACGIH TLV (United States, 3/2012).</b> <b>Absorbed through skin.</b> TWA: 10 ppm 8 hours. TWA: 18 mg/m <sup>3</sup> 8 hours. <b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 20 ppm 8 hours. TWA: 30 mg/m <sup>3</sup> 8 hours. STEL: 30 ppm 15 minutes. STEL: 45 mg/m <sup>3</sup> 15 minutes. <b>NIOSH REL (United States, 1/2013).</b> <b>Absorbed through skin.</b> TWA: 10 ppm 10 hours. TWA: 15 mg/m <sup>3</sup> 10 hours.
di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	<b>AIHA WEEL (United States, 10/2011).</b> TWA: 250 ppm 8 hours.

## Section 8. Exposure controls/personal protection

### 31P S/N

(<sup>2</sup>H)Chloroform

**ACGIH TLV (United States, 3/2012).**

TWA: 10 ppm 8 hours.

TWA: 49 mg/m<sup>3</sup> 8 hours.

**OSHA PEL 1989 (United States, 3/1989).**

TWA: 2 ppm 8 hours.

TWA: 9.78 mg/m<sup>3</sup> 8 hours.

**NIOSH REL (United States, 6/2009).**

STEL: 2 ppm 60 minutes.

STEL: 9.78 mg/m<sup>3</sup> 60 minutes.

**OSHA PEL (United States, 6/2010).**

CEIL: 50 ppm

CEIL: 240 mg/m<sup>3</sup>

Triphenyl phosphate

**ACGIH TLV (United States, 3/2012).**

TWA: 3 mg/m<sup>3</sup> 8 hours.

**OSHA PEL 1989 (United States, 3/1989).**

TWA: 3 mg/m<sup>3</sup> 8 hours.

**NIOSH REL (United States, 1/2013).**

TWA: 3 mg/m<sup>3</sup> 10 hours.

**OSHA PEL (United States, 6/2010).**

TWA: 3 mg/m<sup>3</sup> 8 hours.

### 13C Sensitivity

(<sup>2</sup>H)Chloroform

**ACGIH TLV (United States, 3/2012).**

TWA: 10 ppm 8 hours.

TWA: 49 mg/m<sup>3</sup> 8 hours.

**OSHA PEL 1989 (United States, 3/1989).**

TWA: 2 ppm 8 hours.

TWA: 9.78 mg/m<sup>3</sup> 8 hours.

**NIOSH REL (United States, 6/2009).**

STEL: 2 ppm 60 minutes.

STEL: 9.78 mg/m<sup>3</sup> 60 minutes.

**OSHA PEL (United States, 6/2010).**

CEIL: 50 ppm

CEIL: 240 mg/m<sup>3</sup>

Ethylbenzene

**ACGIH TLV (United States, 3/2012).**

TWA: 20 ppm 8 hours.

**NIOSH REL (United States, 1/2013).**

STEL: 545 mg/m<sup>3</sup> 15 minutes.

STEL: 125 ppm 15 minutes.

TWA: 435 mg/m<sup>3</sup> 10 hours.

TWA: 100 ppm 10 hours.

**OSHA PEL (United States, 6/2010).**

TWA: 435 mg/m<sup>3</sup> 8 hours.

TWA: 100 ppm 8 hours.

**OSHA PEL 1989 (United States, 3/1989).**

STEL: 545 mg/m<sup>3</sup> 15 minutes.

STEL: 125 ppm 15 minutes.

TWA: 435 mg/m<sup>3</sup> 8 hours.

TWA: 100 ppm 8 hours.

### 8.2 Exposure controls

#### Appropriate engineering controls

- : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.



## Section 8. Exposure controls/personal protection

- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
- Individual protection measures**
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: 19F S/N	Liquid.
	15N S/N	Liquid.
	31P S/N	Liquid.
	13C Sensitivity	Liquid.
<b>Color</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Colorless.
<b>Odor</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Pleasant. / Sweet.

## Section 9. Physical and chemical properties

<b>Odor threshold</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>pH</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Melting point</b>	: 19F S/N	5°C (41°F)
	15N S/N	Not available.
	31P S/N	-64°C (-83.2°F)
	13C Sensitivity	-64°C (-83.2°F)
<b>Boiling point</b>	: 19F S/N	80°C (176°F)
	15N S/N	Not available.
	31P S/N	62°C (143.6°F)
	13C Sensitivity	60.9°C (141.6°F)
<b>Flash point</b>	: 19F S/N	Closed cup: -11.11°C (12°F)
	15N S/N	Closed cup: 87.8°C (190°F)
	31P S/N	Not available.
	13C Sensitivity	Closed cup: 15°C (59°F) [(Ethylbenzene)]
<b>Evaporation rate</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Flammability (solid, gas)</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Lower and upper explosive (flammable) limits</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Vapor pressure</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Vapor density</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Relative density</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	1.5
<b>Solubility</b>	: 19F S/N	Insoluble in the following materials: cold water and hot water.
	15N S/N	Soluble in the following materials: cold water and hot water.
	31P S/N	Very slightly soluble in the following materials: cold water and hot water.
	13C Sensitivity	Very slightly soluble in the following materials: cold water and hot water.
<b>Solubility in water</b>	: Not available.	

## Section 9. Physical and chemical properties

<b>Partition coefficient: n-octanol/water</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Auto-ignition temperature</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Decomposition temperature</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.
<b>Viscosity</b>	: 19F S/N	Not available.
	15N S/N	Not available.
	31P S/N	Not available.
	13C Sensitivity	Not available.

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: 19F S/N	No specific test data related to reactivity available for this product or its ingredients.
	15N S/N	No specific test data related to reactivity available for this product or its ingredients.
	31P S/N	No specific test data related to reactivity available for this product or its ingredients.
	13C Sensitivity	No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: 19F S/N	The product is stable.
	15N S/N	The product is stable.
	31P S/N	The product is stable.
	13C Sensitivity	The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: 19F S/N	Under normal conditions of storage and use, hazardous reactions will not occur.
	15N S/N	Under normal conditions of storage and use, hazardous reactions will not occur.
	31P S/N	Under normal conditions of storage and use, hazardous reactions will not occur.
	13C Sensitivity	Under normal conditions of storage and use, hazardous reactions will not occur.
<b>10.4 Conditions to avoid</b>	: 19F S/N	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
	15N S/N	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
	31P S/N	No specific data.
	13C Sensitivity	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

## Section 10. Stability and reactivity

### 10.5 Incompatible materials : 19F S/N

Reactive or incompatible with the following materials:

oxidizing materials

15N S/N

Reactive or incompatible with the following materials:

oxidizing materials

31P S/N

No specific data.

13C Sensitivity

Reactive or incompatible with the following materials:

oxidizing materials

### 10.6 Hazardous decomposition products : 19F S/N

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

15N S/N

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

31P S/N

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

13C Sensitivity

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	LD50 Oral	Rat	930 mg/kg	-
<b>15N S/N</b> Formamide	LD50 Dermal	Rabbit	17 g/kg	-
di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	LD50 Oral	Rat	4000 mg/kg	-
	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	LC50 Inhalation Vapor	Rat	47702 mg/m <sup>3</sup>	4 hours
Triphenyl phosphate	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
	LD50 Dermal	Rabbit	>7900 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	LC50 Inhalation Vapor	Rat	47702 mg/m <sup>3</sup>	4 hours
Ethylbenzene	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
	LC50 Inhalation Gas.	Rat	4000 ppm	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-

#### Irritation/Corrosion

## Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	Eyes - Moderate irritant	Rabbit	-	88 milligrams	-
	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-
<b>15N S/N</b> Formamide	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Ethylbenzene	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-

### Sensitization

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Classification

Product/ingredient name	OSHA	IARC	NTP
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	+	1	Known to be a human carcinogen.
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	-	2B	Reasonably anticipated to be a human carcinogen.
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	-	2B	Reasonably anticipated to be a human carcinogen.

## Section 11. Toxicological information

Ethylbenzene	-	2B	-
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### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Ethylbenzene	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	Category 1	Oral Inhalation	blood system blood system
<b>15N S/N</b> di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	Category 2	Oral	kidneys and liver
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform Triphenyl phosphate	Category 2 Category 2	Not determined Not determined	kidneys and liver nervous system
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Category 2	Not determined	kidneys and liver

### Aspiration hazard

Name	Result
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	ASPIRATION HAZARD - Category 1
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	ASPIRATION HAZARD - Category 1
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform Ethylbenzene	ASPIRATION HAZARD - Category 1 ASPIRATION HAZARD - Category 1

## Section 11. Toxicological information

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

<b>Eye contact</b>	: 19F S/N	Causes serious eye irritation.
	15N S/N	Causes serious eye irritation.
	31P S/N	Causes serious eye irritation.
	13C Sensitivity	Causes serious eye irritation.
<b>Inhalation</b>	: 19F S/N	Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation.
	15N S/N	Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
	31P S/N	Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
	13C Sensitivity	Can cause central nervous system (CNS) depression. May cause drowsiness and dizziness. May cause respiratory irritation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
<b>Skin contact</b>	: 19F S/N	Causes skin irritation. Defatting to the skin.
	15N S/N	No known significant effects or critical hazards.
	31P S/N	Causes skin irritation.
	13C Sensitivity	Causes skin irritation. Defatting to the skin.
<b>Ingestion</b>	: 19F S/N	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.
	15N S/N	Irritating to mouth, throat and stomach.
	31P S/N	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.
	13C Sensitivity	Harmful if swallowed. Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach.

### Symptoms related to the physical, chemical and toxicological characteristics

<b>Eye contact</b>	: 19F S/N	Adverse symptoms may include the following: pain or irritation watering redness
	15N S/N	Adverse symptoms may include the following: pain or irritation watering redness
	31P S/N	Adverse symptoms may include the following: pain or irritation watering redness
	13C Sensitivity	Adverse symptoms may include the following: pain or irritation watering redness



## Section 11. Toxicological information

<b>Inhalation</b>	: 19F S/N	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	15N S/N	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	13C Sensitivity	Adverse symptoms may include the following: respiratory tract irritation coughing nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
<b>Skin contact</b>	: 19F S/N	Adverse symptoms may include the following: irritation redness dryness cracking
	15N S/N	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N	Adverse symptoms may include the following: irritation redness
	13C Sensitivity	Adverse symptoms may include the following: irritation redness dryness cracking
<b>Ingestion</b>	: 19F S/N 15N S/N	No specific data. Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	31P S/N 13C Sensitivity	No specific data. No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

## Section 11. Toxicological information

**Potential delayed effects** : Not available.

### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

<b>General</b>	: 19F S/N  15N S/N  31P S/N  13C Sensitivity	Causes damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. May cause damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure. May cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
<b>Carcinogenicity</b>	: 19F S/N  15N S/N 31P S/N  13C Sensitivity	May cause cancer. Risk of cancer depends on duration and level of exposure. No known significant effects or critical hazards. Suspected of causing cancer. Risk of cancer depends on duration and level of exposure. Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
<b>Mutagenicity</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	May cause genetic defects. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	No known significant effects or critical hazards. May damage the unborn child. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Developmental effects</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Fertility effects</b>	: 19F S/N 15N S/N 31P S/N 13C Sensitivity	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
<b>19F S/N</b> Oral	930.5 mg/kg
<b>15N S/N</b> Oral	4444.4 mg/kg
<b>31P S/N</b> Oral	302.9 mg/kg

## Section 11. Toxicological information

### 13C Sensitivity

Oral

Inhalation (gases)

330.2 mg/kg

40000 ppm

### Other information

: 19F S/N

Not available.

15N S/N

Not available.

31P S/N

Not available.

13C Sensitivity

Not available.

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	Acute EC50 29000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 1360000 µg/l Fresh water	Algae - Scenedesmus abundans	96 hours
	Acute EC50 9230 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 21000 µg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 5.28 ul/L Fresh water	Fish - Oncorhynchus gorbuscha - Fry	96 hours
<b>15N S/N</b> di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	Chronic NOEC 1.5 to 5.4 ul/L Marine water	Fish - Morone saxatilis - Juvenile (Fledgling, Hatchling, Weanling)	4 weeks
	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Acute EC50 13.3 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
Triphenyl phosphate	Acute LC50 81.5 mg/l Marine water	Crustaceans - Penaeus duorarum	48 hours
	Acute LC50 29000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13300 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC10 3.61 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 6300 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Acute EC50 2000 µg/l	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 1000 µg/l	Daphnia - Daphnia magna	48 hours
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Acute EC50 225 µg/l Fresh water	Fish - Oncorhynchus mykiss - Fingerling	96 hours
	Chronic NOEC 55 µg/l Fresh water	Fish - Oncorhynchus mykiss - Fingerling	30 days
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Acute EC50 13.3 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Acute LC50 81.5 mg/l Marine water	Crustaceans - Penaeus duorarum	48 hours

## Section 12. Ecological information

Ethylbenzene	Acute LC50 29000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13300 µg/l Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC10 3.61 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 6300 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Acute EC50 4600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 3600 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 2970 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
Acute LC50 5200 µg/l Marine water	Crustaceans - Americamysis bahia	48 hours	
Acute LC50 4200 µg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours	
Chronic NOEC 1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours	

### 12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<b>13C Sensitivity</b> Ethylbenzene	-	-	Readily

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	2.13	11	low
<b>15N S/N</b> Formamide	-0.82	-	low
di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	-1.35	3.16	low
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	1.97	690	high
Triphenyl phosphate	4.63	144	low
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	1.97	690	high
Ethylbenzene	3.6	-	low

### 12.4 Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.

### 12.5 Other adverse effects

19F S/N : No known significant effects or critical hazards.  
 15N S/N : No known significant effects or critical hazards.  
 31P S/N : No known significant effects or critical hazards.  
 13C Sensitivity : No known significant effects or critical hazards.

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

**Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.**

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## Section 14. Transport information

This Material Safety Data Sheet is written based on the encapsulated substance or mixture in this article. Since the hazardous ingredient is encapsulated, the risk of exposure by inhalation, ingestion, skin contact and eyes contact is minimum.

### **Regulatory information**

**Additional information** : **Remarks**  
De minimis quantities

**DOT / IMDG / IATA** : Not regulated.

## Section 15. Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**U.S. Federal regulations** : **TSCA 8(a) PAIR:** Formamide  
**United States inventory (TSCA 8b):** All components are listed or exempted.  
**Clean Water Act (CWA) 307:** (<sup>2</sup>H)Chloroform; Ethylbenzene  
**Clean Water Act (CWA) 311:** (<sup>2</sup>H)Chloroform; Ethylbenzene  
  
**Clean Air Act (CAA) 112 regulated toxic substances:** (<sup>2</sup>H)Chloroform  
  
**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed  
**Clean Air Act Section 602 Class I Substances** : Not listed  
**Clean Air Act Section 602 Class II Substances** : Not listed  
**DEA List I Chemicals (Precursor Chemicals)** : Not listed

## Section 15. Regulatory information

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	60 - 100	Yes.	-	-	-	-
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	60 - 100	Yes.	-	-	-	-

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Fire hazard  
Immediate (acute) health hazard  
Delayed (chronic) health hazard

#### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	60 - 100	Yes.	No.	No.	Yes.	Yes.
<b>15N S/N</b> Formamide di[( <sup>2</sup> H <sub>3</sub> )Methyl] sulphoxide	60 - 100 5 - 10	No. Yes.	No. No.	No. No.	Yes. Yes.	Yes. Yes.
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform Triphenyl phosphate	60 - 100 1 - 5	No. No.	No. No.	No. No.	Yes. No.	Yes. Yes.
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform Ethylbenzene	60 - 100 5 - 10	No. Yes.	No. No.	No. No.	Yes. Yes.	Yes. Yes.

### SARA 313

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	1076-43-3	60 - 100
	<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	865-49-6	60 - 100
	<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform Ethylbenzene	865-49-6 100-41-4	60 - 100 5 - 10

## Section 15. Regulatory information

<b>Supplier notification</b>	<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	1076-43-3	60 - 100
	<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	865-49-6	60 - 100
	<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform Ethylbenzene	865-49-6 100-41-4	60 - 100 5 - 10

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

- Massachusetts** : The following components are listed: BENZENE; CHLOROFORM; ETHYL BENZENE; FORMAMIDE
- New York** : The following components are listed: Benzene; Chloroform; Methane, trichloro-; Ethylbenzene
- New Jersey** : The following components are listed: BENZENE; CHLOROFORM; METHANE, TRICHLORO-; ETHYL BENZENE; BENZENE, ETHYL-; DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; FORMAMIDE
- Pennsylvania** : The following components are listed: BENZENE; METHANE, TRICHLORO-; BENZENE, ETHYL-; di[(<sup>2</sup>H<sub>3</sub>)Methyl] sulphoxide; FORMAMIDE

### California Prop. 65

**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
<b>19F S/N</b> ( <sup>2</sup> H <sub>6</sub> )Benzene	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)
<b>31P S/N</b> ( <sup>2</sup> H)Chloroform	Yes.	Yes.	20 µg/day (ingestion) 40 µg/day (inhalation)	No.
<b>13C Sensitivity</b> ( <sup>2</sup> H)Chloroform	Yes.	Yes.	20 µg/day (ingestion) 40 µg/day (inhalation)	No.
Ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.

**Canada inventory** : At least one component is not listed in DSL but all such components are listed in NDSL.

### International regulations

- International lists** :
- Australia inventory (AICS):** Not determined.
  - China inventory (IECSC):** All components are listed or exempted.
  - Japan inventory:** Not determined.
  - Korea inventory:** Not determined.
  - Malaysia Inventory (EHS Register):** Not determined.
  - New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.
  - Philippines inventory (PICCS):** Not determined.



## Section 15. Regulatory information

Taiwan inventory (CSNN): Not determined.

**Chemical Weapons  
Convention List Schedule  
I Chemicals** : Not listed

**Chemical Weapons  
Convention List Schedule  
II Chemicals** : Not listed

**Chemical Weapons  
Convention List Schedule  
III Chemicals** : Not listed

## Section 16. Other information

### History

**Date of issue** : 02/25/2014.  
**Date of previous issue** : No previous validation.  
**Version** : 1

✔ Indicates information that has changed from previously issued version.

### Notice to reader

**Disclaimer:** The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.