

SAFETY DATA SHEET

Agilent Technologies

NMR Sample Kit - Direct Detect - 5mm, Part Number 94906571

SECTION 1: Identification of the substance/mixture and of the company/undertaking

This product is considered an article. This 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 - 5mm, Part Number 94906571
Part No. (Kit) : 94906571
Part No. : 19F S/N 96812082
 15N S/N 96812083
 31P Sensitivity - TPP 9100071187
 13C S/N 9100071116

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

Identified uses	
Analytical chemistry.	
4x860µL	
19F S/N	860 µl
15N S/N	860 µl
31P Sensitivity - TPP	860 µl
13C S/N	860 µl

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG
 Hewlett-Packard-Str. 8
 76337 Waldbronn
 Germany
 0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

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

Product definition : 19F S/N Mixture (encapsulated in article)
 15N S/N Mixture (encapsulated in article)
 31P Sensitivity - TPP Mixture (encapsulated in article)
 13C S/N Mixture (encapsulated in article)

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**19F S/N**

H225 FLAMMABLE LIQUIDS - Category 2
 H315 SKIN CORROSION/IRRITATION - Category 2
 H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
 H340 GERM CELL MUTAGENICITY - Category 1B
 H350 CARCINOGENICITY - Category 1A
 H372 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1
 H304 ASPIRATION HAZARD - Category 1

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SECTION 2: Hazards identification

H412 LONG-TERM AQUATIC HAZARD - Category 3

15N S/N

H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
 H360D TOXIC TO REPRODUCTION (Unborn child) - Category 1B
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

31P Sensitivity - TPP

H302 ACUTE TOXICITY (oral) - Category 4
 H315 SKIN CORROSION/IRRITATION - Category 2
 H351 CARCINOGENICITY - Category 2
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
 H412 LONG-TERM AQUATIC HAZARD - Category 3

13C S/N

H225 FLAMMABLE LIQUIDS - Category 2
 H302 ACUTE TOXICITY (oral) - Category 4
 H315 SKIN CORROSION/IRRITATION - Category 2
 H351 CARCINOGENICITY - Category 2
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
 H412 LONG-TERM AQUATIC HAZARD - Category 3

Ingredients of unknown toxicity : 19F S/N Not applicable.
 15N S/N Not applicable.
 31P Sensitivity - TPP Not applicable.
 13C S/N Not applicable.

Ingredients of unknown ecotoxicity : 19F S/N Not applicable.
 15N S/N Not applicable.
 31P Sensitivity - TPP Not applicable.
 13C S/N Not applicable.

Classification according to Directive 1999/45/EC [DPD]

19F S/N The product is classified as dangerous according to Directive 1999/45/EC and its amendments.
 15N S/N The product is classified as dangerous according to Directive 1999/45/EC and its amendments.
 31P Sensitivity - TPP The product is classified as dangerous according to Directive 1999/45/EC and its amendments.
 13C S/N The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : 19F S/N F; R11
 Carc. Cat. 1; R45
 Muta. Cat. 2; R46
 T; R48/23/24/25
 Xn; R65
 Xi; R36/38
 15N S/N Repr. Cat. 2; R61
 31P Sensitivity - TPP Carc. Cat. 3; R40
 Xn; R22, R48/20/22
 Xi; R38
 13C S/N F; R11
 Carc. Cat. 3; R40
 Xn; R22, R48/20/22
 Xi; R38

Physical/chemical hazards : 19F S/N Highly flammable.
 15N S/N Not applicable.
 31P Sensitivity - TPP Not applicable.
 13C S/N Highly flammable.

SECTION 2: Hazards identification

Human health hazards	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	May cause cancer. May cause heritable genetic damage. Also toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Also harmful: may cause lung damage if swallowed. Irritating to eyes and skin. May cause harm to the unborn child. Limited evidence of a carcinogenic effect. Harmful if swallowed. Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed. Irritating to skin. Limited evidence of a carcinogenic effect. Harmful if swallowed. Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed. Irritating to skin.
Environmental hazards	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	Not applicable. Not applicable. Not applicable. Not applicable.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :



Signal word :

: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	Danger Danger Warning Danger
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Hazard statements :

: 19F S/N	GHS02 - Highly flammable liquid and vapour. GHS07 - Causes skin irritation. Causes serious eye irritation. GHS08 - May be fatal if swallowed and enters airways. May cause genetic defects. May cause cancer. Causes damage to organs through prolonged or repeated exposure. Harmful to aquatic life with long lasting effects.
15N S/N	GHS07 - Causes serious eye irritation. GHS08 - May damage the unborn child. May cause damage to organs through prolonged or repeated exposure.
31P Sensitivity - TPP	GHS07 - Harmful if swallowed. Causes skin irritation. GHS08 - Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure. Harmful to aquatic life with long lasting effects.
13C S/N	GHS02 - Highly flammable liquid and vapour. GHS07 - Harmful if swallowed. Causes skin irritation. GHS08 -

SECTION 2: Hazards identification

Suspected of causing cancer.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention	: 19F S/N	P201 - Obtain special instructions before use. P280 - Wear protective gloves. Wear eye or face protection. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P241 - Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. P273 - Avoid release to the environment.
	15N S/N	P260 - Do not breathe vapour. P201 - Obtain special instructions before use. P280 - Wear eye or face protection. P260 - Do not breathe vapour.
	31P Sensitivity - TPP	P201 - Obtain special instructions before use. P280 - Wear protective gloves. P273 - Avoid release to the environment. P260 - Do not breathe vapour.
	13C S/N	P201 - Obtain special instructions before use. P280 - Wear protective gloves. Wear eye or face protection. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P241 - Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. P273 - Avoid release to the environment. P260 - Do not breathe vapour.
Response	: 19F S/N	P301 + P310 + P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
	15N S/N	P314 - Get medical attention if you feel unwell. P308 + P313 - IF exposed or concerned: Get medical attention.
	31P Sensitivity - TPP	P314 - Get medical attention if you feel unwell. P301 + P312 - IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell.
	13C S/N	P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
Storage	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	P235 - Keep cool. P405 - Store locked up. P405 - Store locked up. P235 - Keep cool.
Disposal	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	: 19F S/N (² H ₆)Benzene 15N S/N Formamide di[(² H ₃)Methyl] sulphoxide 31P Sensitivity - TPP (² H)Chloroform	

SECTION 2: Hazards identification

	13C S/N (² H)Chloroform	
Supplemental label elements	: 19F S/N	Not applicable.
	15N S/N	Not applicable.
	31P Sensitivity - TPP	Not applicable.
	13C S/N	Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : For use in industrial installations only.

Special packaging requirements

Tactile warning of danger	: 19F S/N	Not applicable.
	15N S/N	Not applicable.
	31P Sensitivity - TPP	Not applicable.
	13C S/N	Not applicable.

2.3 Other hazards

Other hazards which do not result in classification	: 19F S/N	Defatting to the skin.
	15N S/N	None known.
	31P Sensitivity - TPP	None known.
	13C S/N	None known.

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.

3.2 Mixtures	: 19F S/N	Mixture (encapsulated in article)
	15N S/N	Mixture (encapsulated in article)
	31P Sensitivity - TPP	Mixture (encapsulated in article)
	13C S/N	Mixture (encapsulated in article)

Product/ingredient name	Identifiers	%	Classification		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	
19F S/N (² H ₆)Benzene	EC: 200-753-7 CAS: 1076-43-3 Index: 601-020-00-8	>=90	F; R11 Carc. Cat. 1; R45 Muta. Cat. 2; R46 T; R48/23/24/25 Xn; R65 Xi; R36/38	Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304	[1] [2]
15N S/N Formamide	EC: 200-842-0 CAS: 75-12-7 Index: 616-052-00-8	>=90	Repr. Cat. 2; R61	Repr. 1B, H360D (Unborn child)	[1]
di[(² H ₃)Methyl] sulphoxide	EC: 200-664-3 CAS: 2206-27-1	>=10 - <15	Not classified.	Eye Irrit. 2, H319 STOT RE 2, H373 (kidneys and liver) (oral)	[1]
31P Sensitivity - TPP (² H)Chloroform	EC: 200-663-8 CAS: 865-49-6 Index: 602-006-00-4	>=90	Carc. Cat. 3; R40 Xn; R22, R48/20/22 Xi; R38	Acute Tox. 4, H302 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373	[1] [2]
13C S/N					

SECTION 3: Composition/information on ingredients

(² H)Chloroform	EC: 200-663-8 CAS: 865-49-6 Index: 602-006-00-4	>=75 - <90	Carc. Cat. 3; R40 Xn; R22, R48/20/22 Xi; R38	Acute Tox. 4, H302 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Flam. Liq. 2, H225 Acute Tox. 4, H332	[1] [2]
Ethylbenzene	EC: 202-849-4 CAS: 100-41-4 Index: 601-023-00-4	>=7 - <25	F; R11 Xn; R20 See Section 16 for the full text of the R-phrases declared above.	See Section 16 for the full text of the H statements declared above.	[1] [2]

There are no additional 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.

Type

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

[5] Substance of equivalent concern

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: 19F S/N	Get medical attention immediately. 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.
	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 if irritation occurs.
	31P Sensitivity - TPP	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 if irritation occurs.
	13C 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 if irritation occurs.
Inhalation	: 19F S/N	Get medical attention immediately. 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. 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	Get medical attention immediately. 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an

SECTION 4: First aid measures

		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 Sensitivity - TPP	Get medical attention immediately. 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. 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 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 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.
Skin contact	: 19F S/N	Get medical attention immediately. Wash skin thoroughly with soap and water or use recognised 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. 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 Sensitivity - TPP	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 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.
Ingestion	: 19F S/N	Get medical attention immediately. 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. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious

SECTION 4: First aid measures

15N S/N	<p>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. Get medical attention immediately. 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. 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.</p>
31P Sensitivity - TPP	<p>Get medical attention immediately. 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. 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.</p>
13C S/N	<p>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.</p>
Protection of first-aiders : 19F S/N	<p>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.</p>
15N S/N	<p>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.</p>
31P Sensitivity - TPP	<p>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.</p>
13C S/N	<p>No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.</p>

SECTION 4: First aid measures**4.2 Most important symptoms and effects, both acute and delayed**Potential acute health effects

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

Over-exposure signs/symptoms

Eye contact	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	Adverse symptoms may include the following: irritation watering redness No specific data. No specific data. No specific data.
Inhalation	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	Adverse symptoms may include the following: nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness No specific data.
Skin contact	: 19F S/N 15N S/N 31P Sensitivity - TPP 13C S/N	Adverse symptoms may include the following: irritation redness dryness cracking Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations Adverse symptoms may include the following: irritation redness Adverse symptoms may include the following: irritation redness

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Ingestion	: 19F S/N	Adverse symptoms may include the following: nausea or vomiting
	15N S/N	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	31P Sensitivity - TPP	No specific data.
	13C S/N	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: 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 Sensitivity - TPP	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 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.
Specific treatments	: 19F S/N	No specific treatment.
	15N S/N	No specific treatment.
	31P Sensitivity - TPP	No specific treatment.
	13C S/N	No specific treatment.

SECTION 5: Firefighting measures**5.1 Extinguishing media**

Suitable extinguishing media	: Use dry chemical, CO ₂ , water spray (fog) or foam.	
Unsuitable extinguishing media	: 19F S/N	Do not use water jet.
	15N S/N	Do not use water jet.
	31P Sensitivity - TPP	None known.
	13C S/N	Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: 19F S/N	Highly flammable liquid and vapour. 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. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
	15N S/N	In a fire or if heated, a pressure increase will occur and the container may burst.
	31P Sensitivity - TPP	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
	13C S/N	Highly flammable liquid and vapour. 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. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

SECTION 5: Firefighting measures

Hazardous combustion products	: 19F S/N	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	15N S/N	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides sulfur oxides
	31P Sensitivity - TPP	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds carbonyl halides
	13C S/N	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds carbonyl halides

5.3 Advice for firefighters

Special precautions for fire-fighters	: 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.
	31P Sensitivity - TPP	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 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.
Special protective equipment for fire-fighters	: 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	31P Sensitivity - TPP	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	13C 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel	: 19F S/N	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 spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	15N S/N	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 spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	31P Sensitivity - TPP	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 spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	13C S/N	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 spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: 19F S/N	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".
	15N S/N	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".
	31P Sensitivity - TPP	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".
	13C S/N	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".
6.2 Environmental precautions	: 19F S/N	Avoid dispersal of spilt 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 spilt 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 Sensitivity - TPP	Avoid dispersal of spilt 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 S/N	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant

SECTION 6: Accidental release measures

authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : 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.

6.4 Reference to other sections

: See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures : 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 vapour or mist. Do not swallow. Avoid release to the environment. 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 discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

15N S/N

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 vapour or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. 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.

31P Sensitivity - TPP

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 vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. 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 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 vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate

SECTION 7: Handling and storage

		<p>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 discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.</p>
<p>Advice on general occupational hygiene</p>	<p>: 19F S/N</p> <p>15N S/N</p> <p>31P Sensitivity - TPP</p> <p>13C S/N</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p>7.2 Conditions for safe storage, including any incompatibilities</p>	<p>: 19F S/N</p> <p>15N S/N</p> <p>31P Sensitivity - TPP</p>	<p>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 unlabelled containers. Use appropriate containment to avoid environmental contamination.</p> <p>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 unlabelled containers. Use appropriate containment to avoid environmental contamination.</p> <p>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 unlabelled containers. Use appropriate containment to</p>

SECTION 7: Handling and storage

13C S/N

avoid environmental contamination.
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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

Seveso II Directive - Reporting thresholds (in tonnes)

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
19F S/N P5c: Flammable liquids 2 and 3 not falling under P5a or P5b C2: Toxic C7b: Highly flammable (R11)	5000 50 5000	50000 200 50000
13C S/N P5c: Flammable liquids 2 and 3 not falling under P5a or P5b C7b: Highly flammable (R11)	5000 5000	50000 50000

7.3 Specific end use(s)

Recommendations : 19F S/N Industrial applications, Professional applications.
15N S/N Industrial applications, Professional applications.
31P Sensitivity - TPP Industrial applications, Professional applications.
13C S/N Industrial applications, Professional applications.

Industrial sector specific solutions : 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

Product/ingredient name	Exposure limit values
19F S/N (² H ₆)Benzene	EU OEL (Europe, 12/2009). Absorbed through skin. TWA: 1 ppm 8 hours. TWA: 3.25 mg/m ³ 8 hours.
31P Sensitivity - TPP (² H)Chloroform	EU OEL (Europe, 12/2009). Absorbed through skin. Notes: list of indicative occupational exposure limit values TWA: 2 ppm 8 hours. TWA: 10 mg/m ³ 8 hours.
13C S/N (² H)Chloroform	EU OEL (Europe, 12/2009). Absorbed through skin. Notes: list of indicative occupational exposure limit values TWA: 2 ppm 8 hours. TWA: 10 mg/m ³ 8 hours.
Ethylbenzene	EU OEL (Europe, 12/2009). Absorbed through skin. Notes: list of indicative occupational exposure limit values TWA: 100 ppm 8 hours. TWA: 442 mg/m ³ 8 hours. STEL: 200 ppm 15 minutes. STEL: 884 mg/m ³ 15 minutes.

SECTION 8: Exposure controls/personal protection

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs available.

PNECs

No PNECs available.

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. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

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.

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.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties****Appearance**

Physical state	: 19F S/N	Liquid.
	15N S/N	Liquid.
	31P Sensitivity - TPP	Liquid.
	13C S/N	Liquid.
Colour	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Colourless.
Odour	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Pleasant. / Sweet.
Odour threshold	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
pH	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Melting point/freezing point	: 19F S/N	5°C
	15N S/N	Not available.
	31P Sensitivity - TPP	-64°C
	13C S/N	-64°C
Initial boiling point and boiling range	: 19F S/N	80°C
	15N S/N	Not available.
	31P Sensitivity - TPP	62°C
	13C S/N	60.9°C
Flash point	: 19F S/N	Closed cup: -11.11°C
	15N S/N	Closed cup: 87.8°C
	31P Sensitivity - TPP	Not available.
	13C S/N	Closed cup: 15°C [(Ethylbenzene)]
Evaporation rate	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Flammability (solid, gas)	: 19F S/N	Not applicable.
	15N S/N	Not applicable.
	31P Sensitivity - TPP	Not applicable.
	13C S/N	Not applicable.
Upper/lower flammability or explosive limits	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Vapour pressure	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Vapour density	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Relative density	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	1.5

SECTION 9: Physical and chemical properties

Solubility(ies)	: 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 Sensitivity - TPP	Very slightly soluble in the following materials: cold water and hot water.
	13C S/N	Very slightly soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Auto-ignition temperature	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Decomposition temperature	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Viscosity	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Explosive properties	: 19F S/N	May form explosive mixtures with air.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: 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 Sensitivity - TPP	No specific test data related to reactivity available for this product or its ingredients.
	13C S/N	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: 19F S/N	The product is stable.
	15N S/N	The product is stable.
	31P Sensitivity - TPP	The product is stable.
	13C S/N	The product is stable.
10.3 Possibility of hazardous reactions	: 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 Sensitivity - TPP	Under normal conditions of storage and use, hazardous reactions will not occur.
	13C S/N	Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid :**10.5 Incompatible materials** :

SECTION 10: Stability and reactivity

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 Sensitivity - TPP	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	13C S/N	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
19F S/N (² H ₆)Benzene	LD50 Oral	Rat	930 mg/kg	-
15N S/N Formamide	LD50 Dermal	Rabbit	17 g/kg	-
di[(² H ₃)Methyl] sulphoxide	LD50 Oral	Rat	4000 mg/kg	-
	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
31P Sensitivity - TPP (² H)Chloroform	LC50 Inhalation Vapour	Rat	47702 mg/m ³	4 hours
	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
13C S/N (² H)Chloroform	LC50 Inhalation Vapour	Rat	47702 mg/m ³	4 hours
	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
Ethylbenzene	LC50 Inhalation Gas.	Rat	4000 ppm	4 hours
	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-

Acute toxicity estimates

Route	ATE value
31P Sensitivity - TPP Oral	500.2 mg/kg
13C S/N Oral Inhalation (gases)	555.6 mg/kg 40000 ppm

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
19F S/N (² H ₆)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	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
15N S/N Formamide	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500	-

SECTION 11: Toxicological information

31P Sensitivity - TPP (² H)Chloroform	Eyes - Mild irritant	Rabbit	-	milligrams 100	-
	Skin - Mild irritant	Rabbit	-	milligrams 24 hours 500	-
	Skin - Mild irritant	Rabbit	-	milligrams 100	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
13C S/N (² 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	-

Sensitiser

Conclusion/Summary : Not available.

Chronic toxicity / Carcinogenicity / Mutagenicity / Teratogenicity / Reproductive toxicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
19F S/N (² H ₆)Benzene	Category 1	Not determined	Not determined
15N S/N di[(² H ₃)Methyl] sulphoxide	Category 2	Oral	kidneys and liver
31P Sensitivity - TPP (² H)Chloroform	Category 2	Not determined	Not determined
13C S/N (² H)Chloroform	Category 2	Not determined	Not determined

Aspiration hazard

Product/ingredient name	Result
19F S/N (² H ₆)Benzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : 19F S/N Not available.
 15N S/N Not available.
 31P Sensitivity - TPP Not available.
 13C S/N Not available.

Potential acute health effects

Inhalation : 19F S/N Can cause central nervous system (CNS) depression.
 15N S/N Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
 31P Sensitivity - TPP Can cause central nervous system (CNS) depression.
 Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
 13C S/N Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : Harmful if swallowed. Irritating to mouth, throat and stomach.

SECTION 11: Toxicological information

Skin contact	: 19F S/N	Irritating to skin.
	15N S/N	May cause skin irritation.
	31P Sensitivity - TPP	Irritating to skin.
	13C S/N	Irritating to skin.
Eye contact	: 19F S/N	Irritating to eyes.
	15N S/N	May cause eye irritation.
	31P Sensitivity - TPP	No known significant effects or critical hazards.
	13C S/N	May cause eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	: 19F S/N	Adverse symptoms may include the following: nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	15N S/N	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	31P Sensitivity - TPP	Adverse symptoms may include the following: nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
	13C S/N	No specific data.
Ingestion	: 19F S/N	Adverse symptoms may include the following: nausea or vomiting
	15N S/N	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	31P Sensitivity - TPP	No specific data.
	13C S/N	No specific data.
Skin contact	: 19F S/N	Adverse symptoms may include the following: irritation redness dryness cracking
	15N S/N	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	31P Sensitivity - TPP	Adverse symptoms may include the following: irritation redness
	13C S/N	Adverse symptoms may include the following: irritation redness
Eye contact	: 19F S/N	Adverse symptoms may include the following: irritation watering redness
	15N S/N	No specific data.
	31P Sensitivity - TPP	No specific data.
	13C S/N	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.
Potential delayed effects	: Not available.

SECTION 11: Toxicological informationLong term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	: 19F S/N	Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.
	15N S/N	No known significant effects or critical hazards.
	31P Sensitivity - TPP	Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed.
	13C S/N	Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed.
Carcinogenicity	: 19F S/N	May cause cancer. Risk of cancer depends on duration and level of exposure.
	15N S/N	No known significant effects or critical hazards.
	31P Sensitivity - TPP	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
	13C S/N	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	: 19F S/N	May cause heritable genetic effects.
	15N S/N	No known significant effects or critical hazards.
	31P Sensitivity - TPP	No known significant effects or critical hazards.
	13C S/N	No known significant effects or critical hazards.
Teratogenicity	: 19F S/N	No known significant effects or critical hazards.
	15N S/N	May cause birth defects.
	31P Sensitivity - TPP	No known significant effects or critical hazards.
	13C S/N	No known significant effects or critical hazards.
Developmental effects	: 19F S/N	No known significant effects or critical hazards.
	15N S/N	No known significant effects or critical hazards.
	31P Sensitivity - TPP	No known significant effects or critical hazards.
	13C S/N	No known significant effects or critical hazards.
Fertility effects	: 19F S/N	No known significant effects or critical hazards.
	15N S/N	No known significant effects or critical hazards.
	31P Sensitivity - TPP	No known significant effects or critical hazards.
	13C S/N	No known significant effects or critical hazards.
<u>Toxicokinetics</u>		
Absorption	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Distribution	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Metabolism	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Elimination	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.
Other information	: 19F S/N	Not available.
	15N S/N	Not available.
	31P Sensitivity - TPP	Not available.
	13C S/N	Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
19F S/N (² H ₆)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
15N S/N di[(² H ₃)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
31P Sensitivity - TPP (² 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
13C S/N (² H)Chloroform	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
Ethylbenzene	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
	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
13C S/N Ethylbenzene	-	-	Readily

SECTION 12: Ecological information**12.3 Bioaccumulative potential**

Product/ingredient name	LogP _{ow}	BCF	Potential
19F S/N (² H ₆)Benzene	2.13	11	low
15N S/N Formamide	-0.82	-	low
di[(² H ₃)Methyl] sulphoxide	-1.35	3.16	low
31P Sensitivity - TPP (² H)Chloroform	1.97	690	high
13C S/N (² H)Chloroform	1.97	690	high
Ethylbenzene	3.6	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Methods of disposal : The generation of waste should be avoided or minimised 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.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : 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. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

This Safety Data Sheet (EU_English) 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

ADR/RID / IMDG / IATA : Not regulated.

Additional information : **Remarks**
De minimis quantities

14.6 Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
15N S/N Formamide	Toxic to reproduction	Candidate	ED/87/2012	06/18/2012

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : For use in industrial installations only.

Other EU regulations

Europe inventory : All components are listed or exempted.

Integrated pollution prevention and control list (IPPC) - Air : Listed

list (IPPC) - Air

Product/ingredient name	Carcinogenic effects	Mutagenic effects	Developmental effects	Fertility effects
19F S/N benzene	Carc. 1A, H350	Muta. 1B, H340	-	-
15N S/N formamide	-	-	Repr. 1B, H360D (Unborn child)	-
31P Sensitivity - TPP trichloromethane	Carc. 2, H351	-	-	-
13C S/N trichloromethane	Carc. 2, H351	-	-	-

Seveso II Directive

This product is controlled under the Seveso II Directive.

Danger criteria

SECTION 15: Regulatory information**Category****19F S/N**

P5c: Flammable liquids 2 and 3 not falling under P5a or P5b

C2: Toxic

C7b: Highly flammable (R11)

13C S/N

P5c: Flammable liquids 2 and 3 not falling under P5a or P5b

C7b: Highly flammable (R11)

International regulations**Chemical Weapon Convention List Schedules I, II & III Chemicals**

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Inform Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

International lists**National inventory**

Australia	: Not determined.
Canada	: At least one component is not listed in DSL but all such components are listed in NDSL.
China	: All components are listed or exempted.
Japan	: All components are listed or exempted.
Malaysia	: Not determined.
New Zealand	: All components are listed or exempted.
Philippines	: All components are listed or exempted.
Republic of Korea	: Not determined.
Taiwan	: Not determined.
United States	: All components are listed or exempted.

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

 Indicates information that has changed from previously issued version.

Abbreviations and acronyms :

- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- DNEL = Derived No Effect Level
- EUH statement = CLP-specific Hazard statement
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

SECTION 16: Other information

Classification	Justification
19F S/N Flam. Liq. 2, H225 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Muta. 1B, H340 Carc. 1A, H350 STOT RE 1, H372 Asp. Tox. 1, H304 Aquatic Chronic 3, H412	On basis of test data Calculation method Calculation method Calculation method Calculation method Calculation method Expert judgment Calculation method
15N S/N Eye Irrit. 2, H319 Repr. 1B, H360D (Unborn child) STOT RE 2, H373	Calculation method Calculation method Calculation method
31P Sensitivity - TPP Acute Tox. 4, H302 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method Calculation method Calculation method
13C S/N Flam. Liq. 2, H225 Acute Tox. 4, H302 Skin Irrit. 2, H315 Carc. 2, H351 STOT RE 2, H373 Aquatic Chronic 3, H412	On basis of test data Calculation method Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements : 19F S/N

H225 Highly flammable liquid and vapour.
 H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H319 Causes serious eye irritation.
 H340 May cause genetic defects.
 H350 May cause cancer.
 H372 Causes damage to organs through prolonged or repeated exposure.
 H412 Harmful to aquatic life with long lasting effects.

15N S/N

H319 Causes serious eye irritation.
 H360D (Unborn child) May damage the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H373 (kidneys and liver) (oral) May cause damage to organs through prolonged or repeated exposure if swallowed. (kidneys and liver)

31P Sensitivity - TPP

H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H351 Suspected of causing cancer.
 H373 May cause damage to organs through prolonged or repeated exposure.
 H412 Harmful to aquatic life with long lasting effects.

13C S/N

H225 Highly flammable liquid and vapour.
 H302 Harmful if swallowed.
 H302 (oral) Harmful if swallowed.
 H315 Causes skin irritation.
 H332 (inhalation) Harmful if inhaled.

SECTION 16: Other information

<p>H351 H373</p>	<p>Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure.</p>
<p>H412</p>	<p>Harmful to aquatic life with long lasting effects.</p>
<p>Full text of classifications [CLP/GHS] : 19F S/N Aquatic Chronic 3, H412 Asp. Tox. 1, H304 Carc. 1A, H350 Eye Irrit. 2, H319 Flam. Liq. 2, H225 Muta. 1B, H340 Skin Irrit. 2, H315 STOT RE 1, H372</p>	<p>LONG-TERM AQUATIC HAZARD - Category 3 ASPIRATION HAZARD - Category 1 CARCINOGENICITY - Category 1A SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2 FLAMMABLE LIQUIDS - Category 2 GERM CELL MUTAGENICITY - Category 1B SKIN CORROSION/IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1</p>
<p>15N S/N Eye Irrit. 2, H319 Repr. 1B, H360D (Unborn child) STOT RE 2, H373</p>	<p>SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2 TOXIC TO REPRODUCTION (Unborn child) - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2</p>
<p>STOT RE 2, H373 (kidneys and liver) (oral)</p>	<p>SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys and liver) (oral) - Category 2</p>
<p>31P Sensitivity - TPP Acute Tox. 4, H302 Aquatic Chronic 3, H412 Carc. 2, H351 Skin Irrit. 2, H315 STOT RE 2, H373</p>	<p>ACUTE TOXICITY (oral) - Category 4 LONG-TERM AQUATIC HAZARD - Category 3 CARCINOGENICITY - Category 2 SKIN CORROSION/IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2</p>
<p>13C S/N Acute Tox. 4, H302 Acute Tox. 4, H332 Aquatic Chronic 3, H412 Carc. 2, H351 Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT RE 2, H373</p>	<p>ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 LONG-TERM AQUATIC HAZARD - Category 3 CARCINOGENICITY - Category 2 FLAMMABLE LIQUIDS - Category 2 SKIN CORROSION/IRRITATION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2</p>
<p>Full text of abbreviated R phrases : 19F S/N</p>	<p>R11- Highly flammable. R45- May cause cancer. R46- May cause heritable genetic damage. R48/23/24/25- Also toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed. R65- Also harmful: may cause lung damage if swallowed. R36/38- Irritating to eyes and skin.</p>
<p>15N S/N 31P Sensitivity - TPP</p>	<p>R61- May cause harm to the unborn child. R40- Limited evidence of a carcinogenic effect. R22- Harmful if swallowed. R48/20/22- Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed.</p>
<p>13C S/N</p>	<p>R38- Irritating to skin. R11- Highly flammable. R40- Limited evidence of a carcinogenic effect. R20- Harmful by inhalation. R22- Harmful if swallowed. R48/20/22- Harmful: danger of serious damage to health in case of prolonged exposure through inhalation and if swallowed. R38- Irritating to skin.</p>

SECTION 16: Other information

<p>Full text of classifications [DSD/DPD]</p>	<p>: 19F S/N</p>	<p>F - Highly flammable Carc. Cat. 1 - Carcinogen category 1 Muta. Cat. 2 - Mutagen category 2 T - Toxic Xn - Harmful Xi - Irritant</p>
	<p>15N S/N</p>	<p>Repr. Cat. 2 - Toxic to reproduction category 2</p>
	<p>31P Sensitivity - TPP</p>	<p>Carc. Cat. 3 - Carcinogen category 3 Xn - Harmful Xi - Irritant</p>
	<p>13C S/N</p>	<p>F - Highly flammable Carc. Cat. 3 - Carcinogen category 3 Xn - Harmful Xi - Irritant</p>
<p>Date of issue/ Date of revision</p>	<p>: 10/11/2014</p>	
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