

1. Chemical and Company Identification

Product Name: Iron Oxide Nanoparticles in Toluene

Product Use: Laboratory chemical – R&D use only

Manufacturer/Supplier: Cytodiagnostics Inc., 919 Fraser Drive, Unit 11, Burlington, Ontario, Canada, L7L 4X8

Phone: (866) 344-3954

Web: <https://www.cytodiagnostics.com>

Information and Support: customer_service@cytodiagnosics.com

2. Hazards Identification***Classification of the substance or mixture:***

GHS classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 2), H225

Skin irritation (Category 2), H315

Reproductive toxicity (Category 2), H361

Specific target organ toxicity – single exposure (Category 3), Central nervous system, H336

Specific target organ toxicity – repeated exposure (Category 2), H373

Aspiration hazard (Category 1), H304

Acute aquatic toxicity (Category 2), H401

GHS Label Elements and Precautionary Statements:

Signal Word: Danger

Hazardous Statements

H225

Highly flammable liquid and vapor.

H302 + H332

Harmful if swallowed or if inhaled

H304

May be fatal if swallowed and enters airways.

H315

Causes skin irritation.

H361

Suspected of damaging fertility or the unborn child.

H373

May cause damage to organs through prolonged or repeated exposure.

H410

Toxic to aquatic life.

Precautionary Statements

P201

Obtain special instructions before use.

P202

Do not handle until all safety precautions have been read and understood.

P210

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P233

Keep container tightly closed.

P240

Ground/bond container and receiving equipment.

P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

Hazards not otherwise classified:

None

3. Composition/Information on Ingredients
This product contains: Iron Oxide Nanoparticles (Fe₃O₄) in Toluene

Chemical Formula: Fe₃O₄
Components:
Component 1: Iron Oxide, CAS# 1317-61-9

Component 2: Toluene, CAS# 108-88-3

Component 3: Oleic Acid, CAS# 112-80-1

4. First Aid Measures
In case of skin contact: In case of contact with skin, immediately remove contaminated clothing and wash extensively with soap and water and seek medical advice if symptoms occur.

In case of ingestion: If swallowed and person is conscious wash mouth with water, seek medical advice immediately.

In case of eye contact: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If case of inhalation: In case of accident by inhalation, remove to fresh air. If breathing becomes difficult seek medical advice. If not breathing, give artificial respiration.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2) and/or in section 11.

Immediate medical attention and special treatment needed:

No data available

5. Fire Fighting Measures

Suitable extinguishing media:

Use alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the substance or mixture:

1. Liquid and vapors are highly flammable
2. Severe fire hazard when exposed to heat, flame and/or oxidizers
3. Vapor may travel a considerable distance to source of ignition
4. Heating may cause expansion and decomposition leading to violent rupture of containers

Special protective equipment and precautions for fire-fighters:

Wear self-contained breathing apparatus if necessary. Wear protective gloves.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid aerosols or dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

Methods and materials for containment and cleaning up:

1. Remove all ignition sources
2. Clean up all spills immediately
3. Avoid breathing vapors and contact with skin and eyes
4. Control personal contact by using protective equipment
5. Contain and absorb small quantities with vermiculite or other absorbent material
6. Wipe up
7. Collect residues in a container marked flammable

Do not allow product to enter drains or the environment. For disposal see section 13.

7. Handling and Storage

Precautions for safe handling:

1. Keep container tightly closed in a dry and well-ventilated place. Containers, which are opened, must be carefully resealed and kept upright to prevent leakage.
2. Avoid formation of aerosols.
3. Provide adequate exhaust ventilation at places aerosols may form.
4. Use spark free tools and explosion proof equipment.
5. Wash thoroughly after handling.

Conditions for safe storage:

1. Keep container tightly closed in a dry and well-ventilated place. Containers, which are opened, must be carefully resealed and kept upright to prevent leakage.
2. Store at room temperature under dark conditions.
3. Do not store with acids or oxidizers.

8. Exposure Controls/Personal Protection

Exposure for Toluene solvent

OSHA – Final PELs: 200ppm TWA

OSHA Ceiling: 300ppm

ACGIH: 50ppm, skin-potential for cutaneous absorption

NIOSH: 100ppm TWA: 375 mg/m³ TWA; 550ppm IDLH**Additional information about design of technical systems:** Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.**General protective and hygienic measures:** The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages, and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.**Breathing equipment:** Use suitable respirator when high concentrations are present.**Protection of hands:** Impervious gloves – check gloves using UV light after use to determine level of contamination.**Eye protection:** Safety glasses**Body protection:** Protective work clothing.**9. Physical and Chemical Properties****Form:** Liquid form – Crystalline powder, dissolved in a solvent**Color:** Black**Odor:** Odor dependent upon solvent used. Crystalline powder is odorless**Melting point/Melting range:** ~1538°C to bulk melting point of Fe₃O₄ crystals. The solvent is liquid and melting point depends on the chemical composition of the solvent.**Boiling point/Boiling range:** Determined by solvent used**Sublimation temperature / start:** Not determined**Flash point:** Dependent upon solvent used**Ignition temperature:** Dependent upon solvent used**Decomposition temperature:** Not determined**Danger of explosion:** Dependent upon solvent used. Crystalline powder does not present an explosion hazard.**Explosion limits:** Currently unknown for nanocrystals**Vapor pressure:** Dependent upon solvent used**Density:** 5.2 g/cm³ (crystal at 20 °C) for the nanocrystal powder if isolated**Solubility in / Miscibility with Polar Solvents:** Soluble when hydrophilic ligands are present**Solubility in / Miscibility with Non-Polar Solvents:** Soluble when hydrophobic ligands are present**10. Stability and Reactivity****Reactivity:** Vapor is explosive when exposed to heat or flame**Stability:** Stable at room temperature in closed containers under normal storage and handling conditions **Incompatible materials:** Heat, flame, strong oxidizers, nitric and sulfuric acids, chlorine, nitrogen tetroxide; will attack some forms of plastics, rubber, and coatings**Hazardous decomposition products:** Carbon monoxide, carbon dioxide, hydrocarbons**Thermal decomposition / conditions to be avoided:** Not determined, but temperature increases will affect the solvent used.**In the event of fire:** see section 5**11. Toxicological Information****Acute toxicity:** No data available

Skin corrosion/irritation: No data available

Serious eye damage/eye irritation: Irritating effect

Sensitization: No sensitizing effects known

Germ cell mutagenicity: No data available

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity: Suspected of damaging the unborn child.

Developmental Toxicity: No data available

Specific target organ toxicity – single exposure: May cause drowsiness or dizziness – Central nervous system

Specific target organ toxicity – repeated exposure: May cause damage to organs through prolonged or repeated exposure. – Central nervous system

WARNING: Many of the toxic effects of Fe₃O₄ nanoparticles in toluene are still being researched and are currently unknown at this point. Use at own risk.

12. Ecological Information

Do not allow material to be released into the environment without proper governmental permits.

13. Disposal Considerations

Disposal: Consult a licensed waste disposal specialist for proper destruction. Observe all local, state and federal regulations.

14. Transport Information

U.S. DOT 49 CFR 172.101

ID Number: UN1294

Hazard class: 3

Packing Group: II

Labeling Requirements: Flammable Liquid

Canadian Transportation of Dangerous Goods: UN1294, Class 3

Land Transport ADR/RID: UN1294, Class 3, Class Code F1, Pack group II

Air Transport IATA/ICAO: UN1294, Class or Division 3, Pack group II

Exceptions: 49 CFR 173.4

15. Regulatory Information

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations and the safety data sheet contains all of the information required by those regulations.

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA\ Title III, Section 302. **SARA 313 Components**

The following components are subject to reporting levels established by SARA Title III, Section 313: Toluene

CAS-No. 108-88-3

Revision Date 2007-07-01

Massachusetts Right to Know Components

Toluene CAS-No. 108-88-3

Revision Date 2007-07-01

Pennsylvania Right to Know Components

Toluene CAS-No. 108-88-3

Revision Date 2007-07-01

New Jersey Right to Know Components

Toluene CAS-No. 108-88-3

Revision Date 2007-07-01

Triiron tetraoxide CAS-No. 1317-61-9

Revision Date 2007-01-07

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause cancer.

Toluene CAS-No. 108-88-3

Revision Date 2009-02-16

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

Toluene CAS-No. 108-88-3

Revision Date 2009-02-16

16. Other Information**HMIS Rating**

Health Hazard: 2

Flammability: 3

Physical Hazard: 0

NFPA Rating

Health Hazard: 2

Fire Hazard: 3

Reactivity Hazard: 0

This product is for laboratory research purposes, not for diagnostic or therapeutic use in humans or animals.

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship. Users should make independent decisions regarding completeness of the information based on all sources available. Cytodiagnostics Inc. shall not be held liable for any damage resulting from handling or contact with the above product.

Revision Date: 1.1.2024