

Carbon nanotubes solution According to EC N° 453/2010 Edition date 30/07/2020 Version 4.0

Section 1.- Identification of the substance/mixture and of the company

Identification of the product:
 Carbon nanotubes solution

Chemical family: Graphitized carbon nanotubes

Product name:
 DRP-CNTSOL

Use of the substance/preparation: Research use only

- Manufacturer/supplier identification: Metrohm DropSens, S.L. Vivero de Ciencias de la

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Section 2.- Hazards identification

Caution! To the best of our knowledge the toxicological properties of this material has not been thoroughly investigated. The present substance has been classified according to hazards identification of its components.

If dries, may cause eye, skin and respiratory tract irritation.

Classification of the mixture:

According to Regulation CLP (EC) No1272/2008

- Flammable liquid (Category 3)
- Acute toxicity, inhalation (Category 4)
- Acute toxicity, dermal (Category 4)
- Eye irritation (Category 2)
- Reproductive toxicity (Category 1B)

Label elements:



Hazard statements

H226 - Flammable liquid and vapour

H312 + H332 - Harmful in contact with skin or if inhaled.

H319 – Causes serious eye irritation.

H360D – May damage fertility or the unborn child.

Precautionary statements

P201 – Obtain special instructions before use.

P280 – Wear protective gloves/ protective clothing/ eye protection/ face protection.

P305 + P338 + P351- If in eyes: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing.

P308 + P313 – If exposed or concerned. Get medical advice/ attention.

Supplemental Hazard Statements: None



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Section 3.- Composition/Information on ingredients

Carbon nanotubes Synonyms: Graphitized carbon nanotubes, CNT

CAS: Graphite 7782-42-5 Concentration: 0.05 mg/mL

N,N-Dimethylformamide Synonyms: DMF

CAS: 68-12-2

Molecular weight: 73.09 g/mol

Classification: Flam. Liq. 3: Acute toxicity 4, Eye irritation 2, Repr. 1B

Section 4.- First aid measures

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance.

After skin contact: Wash skin with soap and copious amounts of water.

- After ingestion: Make victim drink plenty of water. Never give anything by mouth to an unconscious person, rinse mouth with water.
- After eye contact: Rinse out with plenty of water with the eyelid held wide open for at least 15 minutes.
- After inhalation: Move the person into fresh air. If it is necessary, give artificial respiration with oxygen.

The most important symptoms and effects are described in the section 2 (label elements).

Section 5.- Fire-fighting measures

- Suitable extinguishing media: use water spray, alcohol resistant foam, dry chemical or carbon dioxide.
- Special hazards arising from the substance: carbon oxides, nitrogen oxides.
- Special protective equipment for fire fighting: Wear self contained breathing apparatus for fire fighting if necessary.
- Further information: Use water spray to cool unopened containers.

Section 6.- Accidental release measures

- Person-related precautionary measures: Use personal protective equipment. Avoid breathing vapours.
 Ensure adequate ventilation.
- Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
- Methods and materials for containment and cleaning up: Contain spillage and then with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.
- Procedures for cleaning/absorption: Keep in suitable, closed containers for disposal.

Section 7.- Handling and storage

- Handling: Avoid eye and skin contact. Avoid inhalation of vapour or mist. Keep away from sources of ignition No smoking. Take measures to prevent the build-up of electrostatic charge.
- Storage: Store in cool place. Keep container tightly closed in a dry and well-ventilated place, protected from sunlight. Opened containers must be kept upright to prevent leakage.

Section 8.- Exposure controls/personal protection

Exposure controls

General industrial hygiene practice

Hand protection
 Handle with gloves. Gloves must be inspected prior to use. Use proper glove

removal technique to avoid skin contact with this product.

Eye protection
 Safety glasses with side-shields conforming to NIOSH (US) or EN166 (EU)

- Skin and body protection Choose body protection according to the amount and concentration of the



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dangerous substance at the work place. Handle with gloves. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and standard EN 374 derived from it.

Hygiene measures
 Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Section 9.- Physical and chemical properties

General information: – Form: liquid

Colour: blackOdour: amine-like

Important health, safety and environmental information:

■ pH value: 6 at 25°C

Boiling temperature: no data available

• Flash point: no data available

Explosion limits (caused by DMF presence) 2.2% (low) to 16% (high)

Vapour pressure: not determined

Density: not determined

Section 10.- Stability and reactivity

Reactivity: No data available

Chemical Stability: No data available.

Possibility of hazardous reactions: No data available.

Incompatible materials: Strong oxidizing agents.

Conditions to avoid: Heat, flames and sparks. Direct sunlight should be avoid.

Hazardous decomposition products: Other decomposition products – no data available.

Further information: Stable under recommended storage conditions.

Section 11.- Toxicological information

Toxicological information related to carbon nanotubes and N,N-Dimethylformamide

	Carbon nanotubes	N,N-Dimethylformamide
LD ₅₀ (oral, rat)	No data available	2800 mg/kg
LC ₅₀ (inhalation, rat)	No data available	9-15 mg/L (4h)
LD ₅₀ (dermal rabbit)	No data available	1500 mg/kg
Skin corrosion/ irritation	No data available	Mild skin irritation (24h)
Serious eye damage/ eye irritation	Causes serious eye irritation	Moderate eye irritation
Respiratory or skin sensitisation	If inhaled, may cause respiratory irritation	No data available
Germ cell mutagenicity	No data available	Mutation in mammalian somatic cells
Reproductive toxicity	No data available	May cause congenital malformation in the fetus
Additional information	No data available	RTECS: LQ2100000

^{*} RTECS: registry of toxic effects of chemical substances

Section 12.- Ecological information:

To the best of our knowledge the ecological effects of this solution have not been thoroughly researched.

Ecological information related to carbon nanotubes: No data available.

Ecological information related to N,N-Dimethylformamide

- LC50- Oncorhynchus mykiss (rainbow trout) 9.000 13.000 mg/L 96h
- LC50- Lepomis macrochirus (Bluegill) 6.700 7.500 mg/L 96h
- LC50- Pimephales promelas (fathead minnow) 10.400 10.800 mg/L 96h
- EC50- Daphnia magna (water flea) 9.600 13.100 mg/L 48h



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- LC50- Desmodesmus subspicatus (green algae) - > 500 mg/L - 96h

Persistence and degradability: Biodegradability, result > 90% - Readily biodegradable

Section 13.- Disposal considerations

- Product: Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose this material.
- Contaminated packaging: Dispose of as unused product.

Section 14.- Transport information

Road transport ADR/RID: - UN-Nº: 2265

- Class 3 Packaging group III

- Proper shipping name: Preparation containing N,N-Dimethylformamide

Sea transport IMDG: - UN-Nº: 2265

- Class 3 Packaging group III

- Marine pollutant: NO

- Proper shipping name: Preparation containing N,N-Dimethylformamide

Air transport IATA:
 UN-N^o: 2265

- Class 3 Packaging group III

- Proper shipping name: Preparation containing N,N-Dimethylformamide

Section 15.- Regulatory information

This safety datasheet has been revised to comply with the requirements establish in (EC) 453/2010.

Section 16.- Other information

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The contents and format of this MSDS are in accordance with EC 453/2010.

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