

Iron Nanoparticles DMF Dispersion

US Research Nanomaterials, Inc.

www.us-nano.com

SAFTY DATA SHEET

Revised Date 8/12/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name: Iron Nanoparticles DMF Dispersion

DMF CAS#: 68-12-2

Iron CAS#: 7439-89-6

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

Identified uses : Research, synthesis of nanomaterial dispersions

1.3 Details of the supplier of the safety data sheet

Company: [US Research Nanomaterials, Inc.](http://www.us-nano.com)

3302 Twig Leaf Lane

Houston, TX 77084

USA

Telephone: +1 832-460-3661

Fax: +1 281-492-8628

1.4 Emergency telephone number

Emergency Phone # : (832) 359-7887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

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

Eye irritation (Category 2A), H319

Flammable liquids (Category 2), H225

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

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H226 Flammable liquid and vapor.

H312 Harmful in contact with skin.

H319 Causes serious eye irritation.

Precautionary statement(s)

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.

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/ eye protection/ face protection.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P363 Wash contaminated clothing before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

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.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Rapidly absorbed through skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

DMF CAS-No. : 68-12-2

Iron CAS#: 7439-89-6

Hazardous components

Component: N,N-Dimethylformamide (DMF)

Classification: Flam. Liq. 3; Acute Tox. 4; Eye Irrit. 2A; Repr. 1B; H226, H312, H319, H360

Concentration: 90-100%

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with

water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder Dry sand

Unsuitable extinguishing media

Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapor or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the buildup of electrostatic charge. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

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.

Handle and store under inert gas.

Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

N,NDimethylformamide: CAS 68-12-2, Value: TWA, Control parameters: 10ppm. USA. ACGIH Threshold Limit Values (TLV)

Remarks: Liver Damage, Adopted values or notations enclosed are those for which changes are proposed in the NIC. See Notice of Intended Changes (NIC). Substances for which there is a Biological Exposure Index or Indices (see BEI® section). Not classifiable as a human carcinogen. Danger of cutaneous absorption.

8.2 Exposure controls

Appropriate engineering controls

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

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance: Form: liquid, colorless

b) Odor: amine-like

c) Odor Threshold: no data available

d) pH: 7 at 200 g/l at 20 °C (68 °F)

e) Melting point/freezing point: Melting point/range: -61 °C (-78 °F) - lit.

- f) Initial boiling point and boiling range: 153 °C (307 °F) - lit.
- g) Flash point: 57.5 °C (135.5 °F) - closed cup - DIN 51755 Part 2
- h) Evaporation rate: no data available
- i) Flammability (solid, gas): no data available
- j) Upper/lower flammability or explosive limits: Upper explosion limit: 16 %(V), Lower explosion limit: 2.2 %(V)
- k) Vapor pressure: 3.77 hPa (2.83 mmHg) at 20 °C (68 °F)
- l) Vapor density: 2.51
- m) Relative density: 0.944 g/mL
- n) Water solubility: 1,000 g/l at 20 °C (68 °F)
- o) Partition coefficient - noctanol/water: log Pow: -0.85 at 25 °C (77 °F) - Bioaccumulation is not expected.
- p) Auto-ignition temperature: 435 °C (815 °F) at 1,013 hPa (760 mmHg) - DIN 51794
- q) Decomposition temperature: > 350 °C (> 662 °F) -
- r) Viscosity: no data available
- s) Explosive properties: no data available
- t) Oxidizing properties: no data available

9.2 Other safety information

Relative vapor density: 2.51

10. STABILITY AND REACTIVITY

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, flames and sparks.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, Nitrogen oxides (NO_x)

Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 3,010 mg/kg
(OECD Test Guideline 401)

LD50 Dermal - Rabbit - 1,500 mg/kg

Remarks: (IUCLID)

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation

Remarks: (IUCLID)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Eye irritation

Remarks: (IUCLID)

Respiratory or skin sensitization

Sensitisation test: - Guinea pig

Result: negative

Remarks: (Lit.)

Sensitisation test: - Mouse

Result: negative

(OECD Test Guideline 406)

Germ cell mutagenicity

Ames test

Salmonella typhimurium

Result: negative

(ECHA)

Mouse - male - Bone marrow

Result: negative

(ECHA)

Carcinogenicity

IARC: 2A - Group 2A: Probably carcinogenic to humans (N,N-Dimethylformamide)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

May damage the unborn child

Specific target organ toxicity - single exposure

Acute oral toxicity - Gastrointestinal disturbance, Nausea, Vomiting

Acute inhalation toxicity - Possible damages: mucosal irritations

Specific target organ toxicity - repeated exposure**Aspiration hazard**

No data available

Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION**12.1 Toxicity**

no data available

12.2 Persistence and degradability

Biodegradability: aerobic - Exposure time 21 d Result: 100 % - Readily biodegradable. (OECD Test Guideline 301E)

Biochemical Oxygen Demand (BOD): 900 mg/g, Remarks: (Lit.)

Theoretical oxygen demand: 1,863 mg/g, Remarks: (Lit.)

12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

reaction with hydroxyl radicals(calculated)(Lit.)

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods****Product**

Contact a licensed professional waste disposal service to dispose of this material. Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION**DOT (US)**

UN number: 2265 Class: 3 Packing group: III
Proper shipping name: N,N-Dimethylformamide
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 2265 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: N,N-DIMETHYLFORMAMIDE

IATA

UN number: 2265 Class: 3 Packing group: III
Proper shipping name: N,N-Dimethylformamide

15. REGULATORY INFORMATION**SARA 302 Components**

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:
N,N-Dimethylformamide CAS-No. 68-12-2, Revision Date: 2007-07-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity

Eye Irrit. Eye irritation

Flam. Liq. Flammable liquids

H226 Flammable liquid and vapor.

H312 Harmful in contact with skin.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

Repr. Reproductive toxicity

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used

only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgment of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.