

Barium Iron Oxide Nanoparticles (BaFe12O19)

US Research Nanomaterials, Inc.

Material Safety Data Sheet

acc. to OSHA and ANSI

1 Identification of substance:

Product details:

Product name: Barium dodecairon nonadecaoxide

Stock number: US3810

Manufacturer/Supplier:

US Research Nanomaterials, Inc.

3302 Twig Leaf Lane

Houston, Texas 77084, USA

www.us-nano.com

2 Composition/Data on components:

Chemical characterization:

Description: (CAS#)

Barium dodecairon nonadecaoxide (CAS# 12047-11-9), 99.5%

Identification number(s):

EINECS Number: 234-387-4

EU Number: 056-002-00-7

3 Hazards identification

Hazard description: Xn Harmful

Information pertaining to particular dangers for man and environment
R 20/22 Harmful by inhalation and if swallowed.

Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

Health (acute effects) =

3 Flammability = 0

Reactivity = 2

4 First aid measures

After inhalation

Supply fresh air. If required, provide artificial respiration.
Keep patient warm.
Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

Special hazards caused by the material, its products of combustion or resulting gases:

In case of fire, the following can be released:
Barium oxide

Protective equipment:

Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

Measures for environmental protection:

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

Measures for cleaning/collecting:

Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

Additional information:

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

Handling

Information for safe handling:

Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

Information about protection against explosions and fires:

The product is not flammable

Storage

Requirements to be met by storerooms and receptacles:

No special requirements.

Information about storage in one common storage facility:

Do not store together with acids.

Further information about storage conditions:

Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

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.

Components with limit values that require monitoring at the workplace:

Barium, and soluble compounds, as Ba
mg/m³

ACGIH TLV	0.5; Not classified as a human carcinogen
Austria MAK	0.5
Belgium TWA	0.5
Denmark TWA	0.5
Finland TWA	0.5
Germany MAK	0.5 (total dust)
Hungary	0.5-STEEL
Ireland TWA	0.5
Korea TLV	0.5
Netherlands MAC-TGG	0.5
Norway TWA	0.5
Poland TWA	0.5; 1.5-STEEL
Sweden TWA	0.5

Switzerland MAK-W 0.5
United Kingdom LTEL 0.5
USA PEL 0.5

Additional information: No data

Personal protective equipment

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.

Breathing equipment:

Use suitable respirator when high concentrations are present.

Protection of hands: Impervious gloves

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information

Form: Powder

Color: Dark brown

Odor: Not determined

Change in condition

	<u>Value/Range</u>	<u>Unit</u>	<u>Method</u>
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<input type="checkbox"/> Melting point/Melting range:	1300	° C	
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<input type="checkbox"/> Boiling point/Boiling range:	Not determined		
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<input type="checkbox"/> Sublimation temperature / start:	Not determined		
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<input type="checkbox"/> Flash point:	Not applicable		
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<input type="checkbox"/> Ignition temperature:	Not determined		
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<input type="checkbox"/> Decomposition temperature:	Not determined		
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Danger of explosion:

Product does not present an explosion hazard.

Explosion limits:

<input type="checkbox"/> Lower:	Not determined		
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<input type="checkbox"/> Upper:	Not determined		
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<input type="checkbox"/> Vapor pressure:	Not determined		
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- Density:** at 20 ° C 5.4 g/cm³
- Solubility in / Miscibility with**
- Water:** Insoluble

10 Stability and reactivity

- Thermal decomposition / conditions to be avoided:**
Decomposition will not occur if used and stored according to specifications.
- Materials to be avoided:** Acids
- Dangerous reactions** No dangerous reactions known
- Dangerous products of decomposition:** Barium oxide

11 Toxicological information

- Acute toxicity:**
- Primary irritant effect:**
- on the skin:** Irritant to skin and mucous membranes.
- on the eye:** Irritating effect.
- Sensitization:** No sensitizing effects known.
- Subacute to chronic toxicity:**
Barium compounds may cause severe gastroenteritis, including abdominal pain, vomiting and diarrhea, tremors, faintness, paralysis of the arms and legs, and slow or irregular heartbeat. Severe cases may produce collapse and death due to respiratory failure. Soluble barium compounds are more likely to cause these effects than insoluble compounds. Inhalation of fumes may cause sore throat, coughing, labored breathing, and irritation of the respiratory tract as well as the above symptoms.
- Additional toxicological information:**
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

- General notes:**
Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:

Recommendation

Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation:

Disposal must be made according to official regulations.

14 Transport information

DOT regulations:

Hazard class: 6.1

Identification number: UN1564

Packing group: III

Proper shipping name (technical name):

Barium compounds, n.o.s., barium

dodecairon

nonadecaoxide

Land transport ADR/RID (cross-border)

ADR/RID class: 6.1 Toxic substances

Item: 60c

Danger code (Kemler): 60

UN-Number: 1564

Description of goods: Barium compounds, n.o.s., barium dodecairon
nonadecaoxide

Maritime transport IMDG:

IMDG Class: 6.1

UN Number: 1564

Packaging group: III

Proper shipping name: Barium compounds, n.o.s., barium dodecairon
nonadecaoxide

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 6.1

UN/ID Number: 1564

Packaging group: III

Proper shipping name: Barium compounds, n.o.s., barium dodecairon
nonadecaoxide

15 Regulations

Product related hazard informations:

Hazard symbols: Xn Harmful

Risk phrases: 20/22 Harmful by inhalation and if swallowed.

Safety phrases:

28 After contact with skin, wash immediately with plenty of water

National regulations

This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use:

For use only by technically qualified individuals. This product contains barium and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement 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 Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.