

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date: 28.08.2018

Version number 2

Revision: 28.08.2018

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

1.1. Product identifier

Trade name: **GGG (Gallium and Gadolinium Garnet)**

Chemical Identification: Gd₃Ga₅O₁₂

CAS Number:

12024-36-1

1.2. Relevant identified uses of the substance or mixture and uses advised against
No further relevant information available.

Application of the substance / the mixture: Substrate for epitaxy

Uses advised against: Other uses than the identified uses indicated above.

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Saint-Gobain Cristaux & Détecteurs

104, Route de Larchant

F-77140 Saint-Pierre-Les-Nemours

Telephone: 0033 (0) 1 64 45 10 10

Fax: 0033 (0) 1 64 45 10 01

Further information obtainable from: customer.service.SGCD@saint-gobain.com

1.4. Emergency telephone number

London, Medical toxicology information service (NHS)

Tel (24 hour): 020 7188 0300

* **SECTION 2: Hazards identification**

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008:

The substance is not classified, according to the CLP regulation.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008: void

Hazard pictograms: void

Signal word: void

(Contd. on page 2)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 28.08.2018

Version number 2

Revision: 28.08.2018

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Hazard statements: void

2.3. Other hazards

Results of PBT and vPvB assessment: This substance does not meet the criteria for classification as PBT or vPvB.

* SECTION 3: Composition/information on ingredients

3.1. Substances

CAS No. Description

12024-36-1 Gadolinium Gallium Garnet (Gd₃Ga₅O₁₂)

* SECTION 4: First aid measures

4.1. Description of first aid measures

General information: No special measures required.

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact:

Brush off loose particles from skin.

Immediately wash with water and soap and rinse thoroughly.

Seek medical attention in case of problems or if problems persist.

After eye contact:

Rinse opened eye for several minutes under running water.

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

Seek medical attention in case of problems or if problems persist.

After swallowing:

Rinse mouth.

Do not induce vomiting; call for medical help immediately.

4.2. Most important symptoms and effects, both acute and delayed

Sharp edges can cause cuts.

4.3. Indication of any immediate medical attention and special treatment needed

First Aid, decontamination, treatment of symptoms.

(Contd. on page 3)

Safety Data Sheet

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* **SECTION 5: Firefighting measures**

5.1. Extinguishing media

Suitable extinguishing agents: Use fire extinguishing methods suitable to surrounding conditions.

For safety reasons unsuitable extinguishing agents: Water with full jet

5.2. Special hazards arising from the substance or mixture

The product is non flammable.

Does not present any particular risk in the event of fire.

5.3. Advice for firefighters

Protective equipment: Wear a self-contained breathing apparatus and chemical resistant suit.

Additional information: Move undamaged containers from immediate hazard area if it can be done safely.

* **SECTION 6: Accidental release measures**

6.1. Personal precautions, protective equipment and emergency procedures

Avoid formation of dust.

Ensure adequate ventilation.

Avoid contact with skin and eyes.

Wear personal protection equipment.

See section 8.

6.2. Environmental precautions Dumping into the environment must be prevented.

6.3. Methods and material for containment and cleaning up

Remove mechanically, placing in appropriate containers for disposal.

6.4. Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

* **SECTION 7: Handling and storage**

7.1. Precautions for safe handling

Prevent formation of dust.

Ensure adequate ventilation.

Wear personal protective equipment. See section 8.

(Contd. on page 4)

Safety Data Sheet

according to 1907/2006/EC, Article 31

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Version number 2

Revision: 28.08.2018

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Information about fire - and explosion protection: Usual measures for fire prevention.

7.2. Conditions for safe storage, including any incompatibilities

Storage:

Requirements to be met by storerooms and receptacles:

Store only in the original container.

Keep container tightly closed in a well-ventilated place.

Information about storage in one common storage facility: Keep away from food, drink and animal feeding stuffs.

Further information about storage conditions:

Ensure that local, federal and national legislation on storage conditions are observed.

Storage class: 13 Incombustible solids (DE TRGS 510)

7.3. Specific end use(s) See section 1.

* SECTION 8: Exposure controls/personal protection

Additional information about design of technical facilities:

Technical measures and the application of adequate working methods take priority over the use of personal protection equipment.

8.1. Control parameters

Ingredients with limit values that require monitoring at the workplace:

Dust, inhalable: WEL (UK): 10 mg/m³ (8h)

Dust, respirable: WEL (UK): 4 mg/m³ (8h)

Source: EH40/2005

Additional information: The lists valid during the making were used as basis.

8.2. Exposure controls

Personal protective equipment:

General protective and hygienic measures:

The usual precautionary measures are to be adhered to when handling chemicals.

Do not eat, drink, smoke or sniff while working.

Ensure adequate ventilation.

Be sure to clean skin thoroughly after work and before breaks.

Wear personal protection equipment.

(Contd. on page 5)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 28.08.2018

Version number 2

Revision: 28.08.2018

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Avoid generation of dust.

Respiratory protection:

In case of unintended releases of dust or if technical suction or ventilation measures are not possible or are insufficient, protective breathing apparatus must be worn.

The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, a self-contained breathing apparatus must be used!

Recommendation:

Dust mask, filter P3

Protection of hands:

Tested protective gloves are to be worn. When handling chemical substances, chemical protective gloves must be worn with CE label including a four digit code. Type of chemical protective gloves to choose depends on the concentration and quantity of dangerous substances as well as on work place specifications. In the cases of special applications, it is recommended to check the chemical resistance with the manufacturer of the gloves.

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Material of gloves:

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Recommendation:

Nitrile rubber, NBR

(EN 374)

If necessary, wear protective gloves against mechanical risks (EN 388).

Penetration time of glove material:

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection:

Selection of eye protection depends on the concentration and quantity of dangerous substances as well as on work place specifications.

Recommendation:

Safety glasses with side shields

(EN 166)

Body protection: Protective work clothing

Limitation and supervision of exposure into the environment: Dumping into the environment must be prevented.

(Contd. on page 6)

Safety Data Sheet

according to 1907/2006/EC, Article 31

Printing date: 28.08.2018

Version number 2

Revision: 28.08.2018

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* **SECTION 9: Physical and chemical properties**

9.1. Information on basic physical and chemical properties

General Information

Appearance:

Form:	Solid Crystalline
Colour:	Light orange colour
Odour:	Odourless

pH-value: No data available.

Change in condition

Melting point/freezing point:	1,750 °C
Initial boiling point and boiling range:	Undetermined.

Flash point: Not applicable.

Flammability (solid, gas): Product is not flammable.

Ignition temperature: Not determined.

Decomposition temperature: Not determined.

Auto-ignition temperature: No data available.

Explosive properties: Product does not present an explosion hazard.

Vapour pressure: Not applicable.

Density: 7.1 g/cm³

Solubility in / Miscibility with water: Insoluble.

Partition coefficient: n-octanol/water: No data available.

9.2. Other information No further relevant information available.

(Contd. on page 7)

Printing date: 28.08.2018

Version number 2

Revision: 28.08.2018

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* **SECTION 10: Stability and reactivity**

10.1. Reactivity The product is stable under standard conditions (temperature, pressure) of storage and handling.

10.2. Chemical stability

The product is stable under standard conditions (temperature, pressure) of storage and handling.

10.3. Possibility of hazardous reactions No dangerous reactions known.

10.4. Conditions to avoid No further relevant information available.

10.5. Incompatible materials Acids

10.6. Hazardous decomposition products No data available.

* **SECTION 11: Toxicological information**

11.1. Information on toxicological effects

Acute toxicity: Based on available data, the classification criteria are not met.

LD/LC50 values:

Oral	LD50	10,000 mg/kg (rat) (Ga ₂ O ₃ data)
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Primary irritant effect:

Skin corrosion/irritation: Based on available data, the classification criteria are not met.

Serious eye damage/irritation: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity: Based on available data, the classification criteria are not met.

STOT-single exposure: Based on available data, the classification criteria are not met.

STOT-repeated exposure: Based on available data, the classification criteria are not met.

Aspiration hazard: Based on available data, the classification criteria are not met.

(Contd. on page 8)

Safety Data Sheet
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Version number 2

Revision: 28.08.2018

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* **SECTION 12: Ecological information**

12.1. Toxicity

Aquatic toxicity: No relevant information available.

12.2. Persistence and degradability No further relevant information available.

12.3. Bioaccumulative potential No further relevant information available.

12.4. Mobility in soil No further relevant information available.

General notes: Do not allow product to reach ground water, water course or sewage system.

12.5. Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6. Other adverse effects No further relevant information available.

* **SECTION 13: Disposal considerations**

13.1. Waste treatment methods

Recommendation:

Waste disposal according to official state regulations.

Dumping into the environment must be prevented.

Uncleaned packaging:

Recommendation:

Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

Packagings that may not be cleansed are to be disposed of in the same manner as the product.

* **SECTION 14: Transport information**

14.1. UN-Number

ADR, ADN, IMDG, IATA

Void.

14.2. UN proper shipping name

ADR, ADN, IMDG, IATA

Void.

(Contd. on page 9)

Safety Data Sheet

according to 1907/2006/EC, Article 31

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Version number 2

Revision: 28.08.2018

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14.3. Transport hazard class(es)

ADR, ADN, IMDG, IATA
Class

Void.

14.4. Packing group
ADR, IMDG, IATA

Void.

14.5. Environmental hazards

Not applicable.

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of Marpol
and the IBC Code

Not applicable.

UN "Model Regulation":

Void.

* SECTION 15: Regulatory information

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

EU-Regulations

Regulation (EC) No 1907/2006 (REACH)

Regulation (EC) No 1272/2008 (CLP)

Regulation 98/24/EC (employee health protection)

Directive 2012/18/EU

Named dangerous substances - ANNEX I: Substance is not listed.

National regulations: National legislation has to be observed!

Information about limitation of use:

Employment restrictions concerning juveniles must be observed.

Employment restrictions concerning pregnant and lactating women must be observed.

Employment restrictions concerning women of child-bearing age must be observed.

Other regulations, limitations and prohibitive regulations: National legislation has to be observed!

15.2. Chemical safety assessment A Chemical Safety Assessment has not been carried out.

* SECTION 16: Other information

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this

(Contd. on page 10)

Safety Data Sheet

according to 1907/2006/EC, Article 31

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Version number 2

Revision: 28.08.2018

Trade name: **GGG (Gallium and Gadolinium Garnet)**

safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

Training hints:

The product should only be handled by persons, who were informed sufficiently about the nature of the product and about the necessary safety precautions.

Classification according to Regulation (EC) No 1272/2008

The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Sources: Data arise from reference works and literature.

* Data compared to the previous version altered.