

SAFETY DATA SHEET

Version: 3

Revision Date: 09/25/2017

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product Identifiers**Product name: *Gold-Silver alloy nanoparticles***1.2 Relevant identified uses of the substance or mixture and uses advised against**Identified use: *Scientific research and development***1.3 Details of the supplier of the safety data sheet**

Manufacturer/Supplier:

*IMRA America, Inc.**1044 Woodridge Ave.**Ann Arbor, MI 48105**Tel: 734-930-2560 (Headquarter); 734-930-9211 (NanoBio Department)**Fax: 734-930-9957 (Headquarter); 734-669-7403 (NanoBio Department)***1.4 Emergency telephone number**

Emergency Phone#: 734-930-2560

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

Classification according to Regulation (EC) No 1272/2008

The product is not classified as hazardous to health or the environment according to the CLP regulation.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

*Not applicable.***2.2 Information concerning particular hazards for human and environment***No information known.**The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.***2.3 Hazards not otherwise classified***No information known.***2.4 Label elements**Labelling according to Regulation (EC) No 1272/2008 – *Not applicable*Hazard pictograms – *Not applicable*Signal word – *Not applicable*Hazard statements – *Not applicable*WHMIS classification – *Not controlled***2.5 Classification system**

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH	1
FIRE	0
REACTIVITY	1

Health (acute effects) = 1

Flammability = 0

Physical Hazard = 1

2.6 Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable

vPvB: Not applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Chemical characterization

Mixtures

3.2 Dangerous components

Not applicable

Non-Hazardous Ingredients		
7647-14-5	Sodium Chloride	≤0.1%
7440-57-5 (Au) 7440-22-4 (Ag)	Gold-Silver alloy nanopowder	≥0.05%
7732-18-5	Water	≤99.85%

4. FIRST AID MEASURES

4.1 Description of 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 medical treatment.

4.2 Information for doctor

Most important symptoms and effects, both acute and delayed

No further relevant information available.

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing agents

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

5.2 Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Sodium oxide

Metal oxide fume

5.3 Advice for firefighters

Wear self-contained respirator.

Wear fully protective impervious suit.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

6.2 Environmental precautions

Do not allow product to reach sewage system or any water course.

Do not allow to penetrate the ground/soil.

6.3 Methods and material for containment and cleaning up

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

6.4 Prevention of secondary hazards

No special measures required.

6.5 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.

7. HANDLING AND STORAGE

7.1 Handling

Precautions for safe handling

Keep container tightly sealed.

Information about protection against explosions and fires

The product is not flammable.

7.2 Conditions for safe storage, including any incompatibilities

Storage requirements to be met by storerooms and receptacles

Refrigerate.

Do not freeze.

Information about storage in one common storage facility

Protect from heat.

Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions

Keep container tightly sealed.

Refrigerate.

Do not freeze.

7.3 Specific end use(s)

No further relevant information available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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- 8.1 Control parameters**
Components with limit values that require monitoring at the workplace
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information
No data
- 8.2 Exposure controls**
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.
Maintain an ergonomically appropriate working environment.
Breathing equipment
Use suitable respirator when high concentrations are present.
Protection of hands
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material but also on quality.
Quality will vary from manufacturer to manufacturer.
Eye protection
Safety glasses
Body protection
Protective work clothing.
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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

General Information	
Appearance	
Form	<i>Liquid</i>
Color	<i>Orange or yellow or green</i>
Odor	<i>Not determined</i>
Odor threshold	<i>Not determined</i>
pH-value	<i>Not determined</i>
Change in condition	
Melting point/Melting range	<i>Not determined</i>
Boiling point/Boiling range	<i>Not determined</i>
Sublimation temperature/start	<i>Not determined</i>
Flammability (solid, gaseous)	<i>Not determined</i>
Ignition temperature	<i>Not determined</i>
Decomposition temperature	<i>Not determined</i>
Auto igniting	<i>Product is not self-igniting.</i>
Danger of explosion	<i>Not determined</i>
Explosion limits	
Lower	<i>Not determined</i>
Upper	<i>Not determined</i>
Vapor pressure at 20 °C (68 °F)	<i>23 hPa (17 mm Hg)</i>
Density	<i>Not determined</i>
Relative density	<i>Not determined</i>
Vapor density	<i>Not determined</i>
Evaporation rate	<i>Not determined</i>

Solubility in/Miscibility with	
Water	<i>Fully miscible</i>
Partition coefficient (n-octanol/water)	<i>Not determined</i>
Viscosity	
Dynamic	<i>Not determined</i>
Kinematic	<i>Not determined</i>
Solvent content	
Organic solvent	<i>0.0%</i>
Solids content	<i>≥0.15%</i>
Other information	<i>No further relevant information available</i>

9.2 Other safety information
No data available.

10. STABILITY AND REACTIVITY

10.1 Reactivity

No information known.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Thermal decomposition/condition to be avoided

Decomposition will not occur if used and stored according to specifications.

10.4 Possibility of hazardous reactions

Water reacts violently with alkali metals.

10.5 Incompatible materials

Heat

Light

Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

10.6 Hazardous decomposition products

Carbon monoxide and carbon dioxide

Sodium oxide

Metal oxide fume

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification

No data

Skin irritation or corrosion

May cause irritation.

Eye irritation or corrosion

May cause irritation.

Sensitization

No sensitizing effects known.

Germ cell mutagenicity

The registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

Carcinogenicity

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA, or ACGIH.

The registry of Toxic effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for components in this product.

Reproductive toxicity

No effects known.

Specific target organ system toxicity – repeated exposure

No effects known.

Specific target organ system toxicity – single exposure

No effects known.

Aspiration hazard

No effects known.

Subacute to chronic toxicity

The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Aquatic toxicity

No further 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.

12.5 Additional ecological information

General notes

Avoid transfer into the environment.

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6 Other adverse effects

No further relevant information available.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Recommendation

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

13.2 Uncleaned packaging

Recommendation

Disposal must be made according to official regulations.

Recommended cleansing agent
Water, if necessary with cleansing agents.

14. TRANSPORT INFORMATION

UN-Number DOT, ADR, ADN, IMDG, IATA	<i>Not applicable</i>
UN proper shipping name DOT, ADR, ADN, IMDG, IATA	<i>Not Dangerous Goods</i>
Transport hazard class (es) DOT, ADR, ADN, IMDG, IATA Class	<i>Not applicable</i>
Packing group DOT, ADR, IMDG, IATA	<i>III</i>
Environmental hazards Marine pollutant (IMDG)	<i>No</i>
Special precautions for user	<i>Not applicable</i>
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	<i>Not applicable</i>
Transport/Additional information DOT Marine Pollutant (DOT)	<i>No</i>
UN "Model Regulation"	<i>Not applicable</i>

15. REGULATORY INFORMATION

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

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
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<i>None of the ingredients are listed</i>

California Proposition 65

Prop 65 – Chemicals known to cause cancer
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<i>None of the ingredients are listed</i>

Prop 65 – Development toxicity

<i>None of the ingredients are listed</i>

Prop 65 – Development toxicity, female

<i>None of the ingredients are listed</i>

Prop 65 – Development toxicity, male

<i>None of the ingredients are listed</i>

Information about limitation of use
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<i>For use only by technically qualified individuals.</i>

Other regulations, limitations and prohibitive regulations

Substances of very high concern (SVHC) according to REACH, Article 57
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<i>None of the ingredients are listed</i>

REACH – Pre-registered substances
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All ingredients are listed

Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

16. OTHER INFORMATION

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)

DOT; US Department of Transportation

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

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

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

vPvB: very Persistent and very Bioaccumulative

ACGIH: American Conference of Governmental Industrial Hygienists (USA)

OSHA: Occupational Safety and Health Administration (USA)

NTP: National Toxicology Program (USA)

IARC: International Agency for Research on Cancer

EPA: Environmental Protection Agency (USA)

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