Material Safety Data Sheet

1. Product and company information

Product name: Gold (I) trisodium disulphite (Au 100g/l aqueous solution)
Company name: Kojima Chemicals Co., LTD.
Address: 337-26, Kashiwabara, Sayama-shi, Saitama-ken
Telephone number: +81 4-2953-9231
Facsimile number: +81 4-2953-9237
Product code: 10010

2. Summary of dangers and hazards

GHS classification: GHS classification is not possible due to lack of sufficient information about this product.

Another information on dangers and hazards

Harmful effects to human health: There is a risk of metal poisoning as an inorganic gold solution. It is expected that some people can get a bad effect on the skin because of weak alkaline. Sulfur dioxide acid gas is generated by addition of strong acid and thermal decomposition, and then may irritate to respiratory.

Environmental impact: Toxic of an alkaline and inorganic salt may have environmental impact.

Physical and chemical hazards: Toxic sulfurous acid gases may be generated by contact with strong acid or heating.

Major signs: It is easily decomposed by contact with acid or heating and generates sulfurous acid gases.

Classification of chemical substances: Acute toxic (inorganic gold salt)

Overview of envisioned emergency: Poisoning caused by sulfurous acid gases by degradation.

3. Composition / Information on ingredients

Single product or mixture: Mixture
General name/Alias: Bis (Surufito) Sodium Gold (1) acid solution
Dangerous and hazardous ingredients: Sodium sulfurous Gold (1) acid (CAS 19153-98-1)
\[ \text{Na}_3\{\text{Au(SO}_3\}_2 \], Residue: Water

Hazardous impurities: Sulfur dioxide, \text{SO}_2

4. First aid measures

Inhalation: Immediately relocate the patient to fresh air and loosen clothing, etc. or keep warm by a blanket. If breathing is difficult, give oxygen. If not breathing, do artificial respiration if necessary.

Skin contact: Immediately remove contaminated clothing and shoes, and then wash thoroughly with water and soap.
Seek medical attention if necessary.

Eye contact: Immediately flush eyes with clean running water for at least 15 minutes, and seek medical attention. During the flush, hold eyelids open and flush thoroughly with

Kojima Chemicals Co., LTD.
Ingestion: Immediately drink plenty of warm water, lukewarm water, milk, and egg albumen, etc., induce vomiting, and then seek medical attention if necessary.

Protection for first-aiders: When you perform mouth-to-mouth resuscitation, avoid breathing hazardous gas which can be included in the patient's breaths.

5. Fire-fighting measures
Fire extinguishing media: Water, sand, and extinguishing powder.
Specific dangers and hazards: Decomposition due to rapid heating can generate hazardous gases.
Specific fire extinguishing method: In case of surrounding fire, immediately remove the container to a safe place. If impossible, cool the container and its surroundings with water spry. When combustible materials are ignited, extinguish them with plenty of water.
Protection for firefighters: Extinguish a fire from the upwind with air-supplied respirator or oxygen mask, etc.

6. Accidental leak measures
Personal precautions: To prevent inhalation of mist or decomposed gases, work from the upwind with an air-supplied respirator or oxygen mask. Stretch a rope around the spillage area to seal off access.
Environmental precautions: Prevent the spread of concentrated solution's leak into the soil or river by using sandbags or adsorbent etc.
Removal method: Absorb the spilled materials by sand or absorbent, and return them to chemical containers. After that, wash the surroundings with plenty of water.

7. Cautions about handling and storage

【Handling】
Technical measures: It is desirable to install local exhaust facility, general ventilation system, oxygen mask, eyewash, shower, etc.
Cautions: Hand in local exhaust facility installed place, and wear protective goggles and protective gloves etc. to prevent contact with this product.
Cautions for safe handling: Avoid contact of this product with acids. No ignition.

【Storage】
Technical measures: The storage should be a lockable place. Store the product separately from poisons, other hazardous materials, or ordinary substances.
Prohibited substances in storage: Acids
Conditions: Store in light blocking and airtight container at a cool dark place. Avoid high temperatures and light.
Materials of containers and packages: Use sealed polyethylene, polypropylene or glass container, etc.
Do not use containers for food.

8. Exposure controls / Personal protection
Equipment measures: Local exhaust facility, general ventilation system, eyewash shower facilities.
Allowable concentration: ACGIH (1992); Sulfur dioxide (reference) 5.2mg/m³ (TWA)
Sodium hydrogen sulfite (reference) 5mg/m³ (TWA)
9. Physical and chemical properties

Physical conditions: Color and shape; Colorless clear liquid
Odor; Weak sulfur dioxide odor    pH; Alkaline
Specific temperature or temperature range of physical state changes:
Decomposed at high temperatures

Density: No data
Solubility: Mixed with water

10. Stability and reactivity

Stability: If you leave the container open or the container is exposed to direct sunlight, light pink
decomposition product (which seems to be colloidal gold) may be precipitated.
Hazardous reaction under specific conditions: The product can generate sulfur dioxide gases by
reacting with acids or being decomposed by high temperature.

Conditions to be avoided: High temperature
Materials to be avoided: Acids
Hazardous decomposition products: Sulfur dioxide gas (SO₂)

11. Hazard and toxicity information

Acute toxicity: Toxicity of soluble compounds of gold (reference)
Au dust or insoluble Au salts are nontoxic for oral administration, but soluble
compounds show following toxicity. Acute toxicity is similar to that of As, and it
causes intense diarrhea, Gastritis, Colitis, Dermatitis, Degeneration of renal
epithelial and necrosis. Other toxic effects on humans include fever, nausea,
vomiting, sensitivity to light, leukopenia, anemia and so on.
Subcutaneous implantation of Gilt causes tumor. Au salts combine with DNA.
Colloidal compounds distribute in the order corresponding to the liver > pancreas >
kidney, soluble Au compounds distribute in the order corresponding to the kidney >
Liver > pancreas. About 90% of absorbed materials will remain in the body.

Local effect: None found. Because of properties of alkaline, this product may be irritating to skin
and mucous membranes.

12. Environmental impact information

Mobility: Because of water solubility, it may move in an aqueous system.
Persistence / degradability: Resolved to metals in nature.

13. Disposal considerations

Residual waste: Since this product contains precious metal, it is desirable to entrust professional
contractors to recover the gold.

Contaminated containers and packages: Used containers, packages should be washed thoroughly and should be burned.

14. Transport considerations

【International regulations】(Information for Code and Classification)
Not applicable
【Special safety measures and conditions in transport】
Check the containers are sealed, and transport them away from high temperature conditions. In addition, make sure to fix the containers and take measures to cushion the shock during transportation.

15. Applicable laws and regulations

【Legal restrictions】
Poisonous and Deleterious Substances Control Law Cabinet Order(Deleterious Substances)
Article 2 “inorganic gold salts”
Follow all applicable local, regional and national rules and regulations.

16. Other information

【Specific training needs】
Pay close attention to the handling of poisonous and deleterious substances. Please try to prevent accidents by education and training for workers, for example, occupational safety and health, safety to prevent leakage, emergency response and environmental impact. And take care when handling the precious metal compound, and also actively collecting surplus, waste, etc needed for reuse them.

【Recommended handling of chemical substance】
It is recommended to use this product immediately after opening it. For any remaining product that is not used, close tight and store it in a dark cool place and use it as soon as possible. For an opened product which has been stored for a long time, refrain from using it since the chemical properties may have changed and dispose of it or recycle it. After using it, dispose with appropriate detoxification, and try not to release hazardous substances into the environment.

【Restrictions】
While this MSDS has been prepared based on the updated documents or information which is available at the present, such information may not always be sufficient to assess risk and hazard of the material. Accordingly, adequate care should be paid in handling the material. In addition, cautions described in this MSDS are indicated for the normal handling of this material. Therefore, in case of special handling, appropriate measures should be taken for safety according to the particular way it is used.
The description in this MSDS is general data on the chemical compound and is not a guarantee as to these descriptions or specifications of the product or those of a material containing it.

【References】
Chemical Comprehensive Dictionary (Kyoritsu Shuppan Co., Ltd.)
JIS-Z-7250 (Japanese Industrial Standard: 2005)
Kojima Chemicals Co., LTD.