Sodium Metabisulfite (SMBS)

CAS Number: 7681-57-4
Chemical Formula: $Na_2S_2O_5$
UN Number: 2693
EC Number: 231-673-0
Purity: 97–99%

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1. Product Identification

- **Product Name:** Sodium Metabisulfite
- **Synonyms:** Sodium pyrosulfite, Disodium disulfite
- **Recommended Uses:**
  - Water treatment (dechlorination)
  - Food preservative (E223)
  - Photographic chemicals
  - Pulp & paper bleaching
  - Leather processing
  - Chemical manufacturing

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2. Hazards Identification

GHS Classification

- Acute Toxicity (Oral): Category 4
- Skin Irritation: Category 2
- Eye Irritation: Category 2A
- Respiratory Sensitization: Category 1
- Aquatic Toxicity: Category 3

GHS Symbols

☣ **Irritant** | ⚠ **Harmful**

Hazard Statements

- H302: Harmful if swallowed
- H315: Causes skin irritation
- H319: Causes serious eye irritation

- H334: May cause respiratory allergy
- H402: Harmful to aquatic life
- **Reacts with acids to release sulfur dioxide gas (toxic).**

Precautionary Statements

- Avoid dust inhalation
- Use PPE: gloves, mask, goggles
- Use only in well-ventilated areas

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3. Composition / Information on Ingredients

Component	CAS No.	% by Weight
Sodium Metabisulfite	7681-57-4	97–99%
Impurities (Na_2SO_3, Na_2SO_4)	—	<1–2%

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4. First Aid Measures

Inhalation

- Move to fresh air immediately
- Loosen tight clothing
- If breathing difficulty persists, seek medical attention

Skin Contact

- Wash with plenty of soap and water
- Remove contaminated clothing
- Seek medical help if irritation continues

Eye Contact

- Rinse carefully with water for **15–20 minutes**
- Remove contact lenses if present
- Get immediate medical attention

Ingestion

- Rinse mouth; DO NOT induce vomiting
- Give water to dilute

- Seek medical advice immediately

Important: Exposure with acids releases SO_2 gas which may cause bronchospasm.

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5. Fire-Fighting Measures

- **Non-flammable**, but decomposes in heat
- Thermal decomposition releases **sulfur dioxide (SO_2)** and **sulfur trioxide (SO_3)**
- **Suitable extinguishing media:**
  - Water spray
  - CO_2
  - Dry chemical

Firefighter Protection

- Wear **SCBA**
- Avoid exposure to fumes

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6. Accidental Release Measures

- Avoid creating dust
- Provide ventilation
- Use gloves and mask during cleanup
- Sweep up material carefully and place in dry container
- Wash contaminated area with plenty of water
- Prevent entry into waterways

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7. Handling & Storage

Handling

- Use in ventilated area
- Avoid direct contact with skin/eyes
- Avoid inhaling dust
- Do not mix with acids or oxidizing agents

Storage

- Store in tightly closed bags/drums
- Keep in **cool, dry, well-ventilated** place
- Keep away from moisture, heat, and acidic materials
- Keep away from food products

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8. Exposure Controls / Personal Protection

Occupational Exposure Limits

- **SO_2 gas** (from decomposition):
  - OSHA PEL: 5 ppm
  - ACGIH: 2 ppm (TWA)

Engineering Controls

- Local exhaust ventilation
- Dust extraction systems

Personal Protective Equipment (PPE)

- **Respiratory:** NIOSH-approved dust mask or respirator
- **Eye:** Safety goggles / face shield
- **Skin:** Rubber gloves, long sleeves
- **Other:** Safety boots

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9. Physical & Chemical Properties

Property	Value
Appearance	White to off-white crystalline powder
Odor	Pungent SO_2 smell
Molecular Weight	190.1 g/mol
Solubility	Soluble in water
pH (1% solution)	4.0 – 5.0
Melting/Decomposition	>150°C (decomposes)
Bulk Density	1.3 – 1.4 g/cm³
Stability	Stable in dry conditions
Vapor Pressure	Not applicable

Property	Value
Flash Point	Not flammable

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10. Stability & Reactivity

- **Stable** under recommended conditions
- Reacts with **acids** → releases **toxic SO_2 gas**
- Incompatible with:
  - Acids
  - Strong oxidizers
  - Moisture (slow decomposition)
- Thermal decomposition produces:
  - SO_2, SO_3

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11. Toxicological Information

Acute Toxicity

- Oral LD50 (rat): 1131 mg/kg
- Inhalation: Irritating to respiratory tract

Potential Health Effects

- **Inhalation:** Wheezing, coughing, breathing difficulty
- **Skin:** Redness, irritation
- **Eyes:** Severe irritation, redness, burning
- **Ingestion:** Nausea, vomiting, abdominal pain

Chronic Exposure

- May cause **asthma-like symptoms** in sensitive individuals
- Repeated exposure may cause **respiratory sensitization**

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12. Ecological Information

- Harmful to aquatic life in high concentrations
- Biodegradable: Oxidizes to sodium sulfate

- Not bioaccumulative
- Prevent release to surface water

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13. Disposal Considerations

- Dispose according to **local environmental regulations**
- Do not discharge into drains
- Neutralize before disposal if needed
- Use licensed waste disposal contractors
