

ASCORBIC ACID MSDS

Section 1: Identification

- **Product Name:** Ascorbic Acid (Vitamin C), CAS 50-81-7, EC No. 200-066-2

Section 2: Hazards Identification

- **Label Elements**
 - **Signal Word:** Warning
 - **Hazard Statements:**
 - H226: Flammable liquid and vapour
 - H319: Causes serious eye irritation
- **Overview (from Chemical Sweeteners / FoodChem Additives):**
 - Slight hazard in case of inhalation, skin contact, ingestion, or eye contact

Section 3: Composition / Information on Ingredients

- **Substance:** Ascorbic acid – 100% pure; Synonyms: vitamin C
- **Impurities (food-grade):** Heavy metals $\leq 0.0003\%$, lead ≤ 2 mg/kg, mercury ≤ 1 mg/kg, arsenic ≤ 2 mg/kg

Section 4: First-Aid Measures

- **Inhalation:** Move to fresh air; if not breathing, give artificial respiration; seek medical aid if symptoms occur
- **Skin Contact:** Flush with soap and water for at least 15 min; remove contaminated clothing; seek medical advice if irritation persists
- **Eye Contact:** Rinse eyes thoroughly for 15 min, lifting eyelids; seek medical attention if irritation develops
- **Ingestion:** Rinse mouth; drink 2–4 cups of water or milk if conscious; do not induce vomiting; get medical assistance

Symptoms / Effects:

- Skin, eye, and respiratory irritation; ingestion may cause gastrointestinal discomfort, diarrhea, allergic reactions, and—rarely—renal oxalate stones
- For chronic or acute concerns: monitor renal and hematological parameters

Section 5: Fire-Fighting Measures

- **Extinguishing Media:** Water spray, dry chemical, CO₂, or Halon; avoid directing water straight into the container
- **Hazards:** Emits carbon oxides; can decompose and release irritating fumes; dust may be combustible at high concentration

- **Protection for Firefighters:** Use self-contained breathing apparatus and full protective clothing

Section 6: Accidental Release Measures

- Avoid dust formation; sweep up using non-sparking tools; moisten spills to prevent dust; collect and rinse remaining material with water
- Use appropriate PPE; ventilate the area; prevent runoff into drains or waterways

Section 7: Handling and Storage

- **Handling:** Avoid dust generation, inhalation, and contact with eyes/skin; handle in well-ventilated areas; use non-sparking tools; no smoking/open flames nearby
- **Storage:** Keep in cool, dry, and dark place in tightly closed containers; protect from air, light, and incompatible materials (strong oxidizers, bases)

Section 8: Exposure Controls / Personal Protection

- **Occupational Limits:** None established
- **Engineering Controls:** Use local exhaust and general ventilation; have eye-wash and safety shower systems available
- **PPE:**
 - Eyes: Safety glasses or goggles
 - Skin: Protective gloves (e.g. nitrile) and protective clothing
 - Respiratory: Use particulate respirator when dust is present

Section 9: Physical and Chemical Properties

- **Appearance:** White or nearly white crystalline powder
- **Odor:** Odorless
- **pH (5% w/v):** ~2.2–2.5
- **Melting Point:** ~191–192 °C (decomposes)
- **Solubility:** ~330 g/L in water at 25 °C
- **Molecular Weight:** 176.12 g/mol
- **Bulk Density:** ~1.65 g/cm³ or 500–900 kg/m³

Section 10: Stability and Reactivity

- **Reactivity:** Strong reducing agent; reacts violently with oxidizers; aqueous solutions are acidic and can oxidize rapidly
- **Stability:** Stable under ambient conditions when dry; aqueous solutions oxidize in presence of air, light, and heat
- **Incompatibilities:** Strong oxidizers, alkalis, heavy metal salts (Cu, Fe), dyes, oxygen-rich environments
- **Decomposition Products:** Carbon oxides and irritating fumes when heated or burned

Section 11: Toxicological Information

- **LD₅₀ (oral, rat):** 11,900 mg/kg
- **Skin Irritation:** No irritation (rabbit)
- **Eye Irritation:** Slight irritation (rabbit)
- **Chronic Effects:** Large doses may cause GI issues, urinary acidification, crystal formation in kidneys, reduced reaction times; not considered carcinogenic

Section 12: Ecological Information

- **Aquatic Toxicity:**
 - Fish (rainbow trout): LC₅₀ ≈ 1,020 mg/L (96 h)
 - Daphnia: EC₅₀ ≈ 360 mg/L (48 h)
 - Algae: IC₅₀ ≈ 1,750 mg/L (72 h)
 - Bacteria (*Pseudomonas putida*): EC₅₀ ≈ 140 mg/L (16 h)
- **Biodegradability:** Readily biodegradable (~97%)
- **Bioaccumulation:** Low potential; not considered persistent, bioaccumulative, or toxic (PBT/vPvB)

Section 13: Disposal Considerations

- **Product:** Dispose at licensed chemical destruction facilities or controlled incineration with gas scrubbing; avoid environmental contamination
- **Packaging:** Triple-rinse containers for recycling or puncture and landfill; combustible packages may be incinerated with scrubbing
- **Local Option (SDS example):** Neutralize and dilute with water, adjust to pH 6–9, then flush with large volumes of water