**Material Safety Data Sheet**

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**DISSOLVED OXYGEN TEST**

**WINKLER COLORIMETRIC METHOD**

**DO Reagent #1 (Manganous Sulfate Solution) 4167**

**HAZARDOUS INGREDIENTS:** Manganese Sulfate Monohydrate [CAS# 10034-96-5].

**PHYSICAL:** Clear pink liquid; soluble in water; no odour.

**FIRE & EXPLOSION:** Not a fire hazard.

**REACTIVITY:** Stable.

**HEALTH HAZARD:** Toxicity unknown (manganese could be a tumorigen, mutagen reproductive effector); primary routes of entry are ingestion and skin; harmful if swallowed; contact with skin or eyes causes irritation; not carcinogenic.

**FIRST AID:**

**Eye contact**: Flush eyes with water for 15 minutes, consult a physician.

**Ingestion**: Induce vomiting immediately, consult a physician.

**Skin** **contact**: Flush thoroughly with water, remove affected clothing, wash skin with soap and water, consult a physician.

**SPILL & DISPOSAL:** Mop up spills carefully and hold for disposal. Dispose small quantities by flushing with water down drain; dispose large quantities in containers according to regulations.

**PRECAUTIONS:**

**Handling**: Use gloves, eye protection, and a lab coat.

**Hygiene**: Wash after handling.

**DO Reagent #2 (Alkaline Potassium Iodide Azide) 7166**

**HAZARDOUS INGREDIENTS:** Potassium Hydroxide [CAS# 1310-58-3]; Sodium Azide [CAS# 26628-22-8]; Potassium Iodide [CAS# 7681-11-0]

**PHYSICAL:** Clear colourless liquid; soluble in water; no odour.

**FIRE & EXPLOSION:** Not a fire hazard; firefighters wear breathing apparatus and protective clothing to prevent inhalation and eye contact; can react with metals to produce explosive hydrogen/air mixture; violent exothermic reaction occurs with water (possibly hot enough to ignite combustibles).

**REACTIVITY:** Stable; avoid heat; avoid contact with strong acids and metals; decomposes to hazardous hydrogen gas.

**HEALTH HAZARD:** Toxic; primary route of entry is the skin; causes severe burns; may be fatal if swallowed; not carcinogenic.

**FIRST AID:**

**Eye contact**: Immediately flush eyes with water for 15 minutes, get immediate medical attention.

**Ingestion**: do not induce vomiting immediately, rinse mouth, drink lots of water, call a physician immediately.

**Skin contact**: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, consult a physician.

**SPILL & DISPOSAL:** Neutralize by slowly adding hydrochloric acid (6M or less) to pH 7. Flush small amounts (<25 ml) of neutralized waste with water to drain; dispose of large amounts as hazardous waste according to regulations (sodium azide reacts with metal to form explosive metal azides).

**PRECAUTIONS:**

**Handling**: Use gloves, eye protection, and a lab coat.

**Hygiene**: Avoid contact with skin and clothing.

**Storage**: Store away from acids and metals.

**DO Reagent #3 (Sulfuric Acid 1:1) 6141**

**HAZARDOUS INGREDIENTS:** Sulfuric Acid [CAS#7664-93-9]

**PHYSICAL:** Colourless liquid; soluble in water; no odour.

**FIRE & EXPLOSION**: Flammable; extinguish using dry chemical or CO2, not water; wear breathing apparatus and protective equipment; reacts exothermically and violently with water; reacts with metals to form flammable, explosive hydrogen gas.

**REACTIVITY:** Stable; avoid contact with water, metals, organic or combustible materials, and strong bases; decomposes to SOx and hydrogen gas.

**HEALTH HAZARD:** Toxic; primary routes of entry are skin, inhalation, and ingestion; corrosive to all body parts; ingestion may be fatal; inhalation causes coughing, chest pains, damage to lungs; not carcinogenic.

**FIRST AID:**

**Eye contact**: Immediately flush eyes with water for 15 minutes, and get immediate medical attention.

**Ingestion**: Do not induce vomiting immediately, rinse mouth, drink lots of water and call a physician immediately.

**Inhalation**: Remove to fresh air, give artificial respiration if needed, or give oxygen if breathing is difficult.

**Skin contact**: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, and consult a physician.

**SPILL & DISPOSAL:** Wear gloves and eye protection; cover spills with sodium bicarbonate or soda ash/calcium carbonate mixture; mix and carefully add water to form a slurry, avoiding heat, spattering, fumes; scoop up, add water and flush to drain. Dispose by stirring very slowly into a large volume of soda ash and calcium hydroxide, pour neutralized solution plus water down drain; dispose according to local regulations.

**PRECAUTIONS:**

**Handling**: Use gloves, eye protection, and a lab coat.

**Hygiene**: Avoid inhalation and contact with skin and clothing.

**Storage**: Store away from bases, metal powders, combustible materials.

**AVAILABLE PHOSPHATE TEST**

**Phosphate Acid Reagent V-6282**

**HAZARDOUS INGREDIENTS:** Sulfuric Acid [CAS#7664-93-9]; Ammonium Molybdate [CAS# 12054-85-2]; Antimony Potassium Tartrate [CAS# 28300-74-5].

**PHYSICAL:** Clear colourless liquid; soluble in water; slight odour.

**FIRE & EXPLOSION:** Not a fire hazard; firefighters wear breathing apparatus and protective equipment; reacts exothermically and violently with water; reacts with metals to form flammable, explosive hydrogen gas.

**REACTIVITY:** Stable; avoid contact with water, metals, organic or combustible materials, and strong bases; decomposes to SOx and hydrogen gas.

**HEALTH HAZARD:** Toxic; primary routes of entry are skin and ingestion; corrosive to all body parts; ingestion may be fatal; inhalation causes coughing, chest pains, damage to lungs; not carcinogenic.

**FIRST AID:**

**Eye contact**: Immediately flush eyes with water for 15 minutes, get immediate medical attention.

**Ingestion**: Do not induce vomiting immediately, rinse mouth, drink lots of water, call a physician immediately.

**Inhalation**: Remove to fresh air, give artificial respiration if needed, or give oxygen if breathing is difficult.

**Skin contact**: Immediately flush with water while removing affected clothing, rinse skin thoroughly for 15 minutes, consult a physician.

**SPILL & DISPOSAL:** Wear gloves and eye protection; cover spills with sodium bicarbonate or soda ash/calcium carbonate mixture; carefully add water to form a slurry, avoiding heat, spattering and fumes; scoop up, add water and flush to drain. Dispose by stirring very slowly into a large volume of soda ash/slaked lime, pour neutralized solution plus water down drain; dispose according to local regulations.

**PRECAUTIONS**:

**Handling**: Use gloves, eye protection, and a lab coat.

**Hygiene**: Avoid inhalation and contact with skin and clothing.

**Storage**: Store away from alkalis.

**Phosphate Reducing Reagent V-6283**

**HAZARDOUS INGREDIENTS:** D(-)-Isoascorbic Acid [CAS# 89-65-6]; Sucrose [CAS# 57-50-01].

**PHYSICAL:** White powder; soluble in water; no odour.

**FIRE & EXPLOSION:** Extinguish with water spray; firefighters wear breathing apparatus and protective equipment; reacts with chemically active metals (Zn, Al, Mg, Cu) to form flammable, explosive hydrogen gas.

**REACTIVITY:** Stable; avoid heat and moisture. Incompatible with strong oxidizers (nitric, sulfuric acid) and metals; decomposes to COx.

**HEALTH HAZARD:** Not toxic; primary routes of entry are skin, inhalation and ingestion; dust may irritate eyes, skin respiratory tract; not carcinogenic.

**FIRST AID:**

**Eye contact**: Flush with water for 15 minutes.

**Ingestion**: Rinse mouth, drink plenty water.

**Inhalation**: Remove to fresh air.

**Skin contact**: Rinse skin, wash with soap and water.

**SPILL & DISPOSAL**: Sweep up (careful not to raise and breathe dust), dissolve in water and flush down drain with water. Dispose by dissolving in water, flushing down drain with water; dispose according to local regulations.

**PRECAUTIONS:**

**Handling**: Use gloves, eye protection, and a lab coat.

**Hygiene**: Avoid inhalation and contact with skin.