

MATERIAL SAFETY DATA SHEET

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COPPER ETCHANT TYPE 100/200

TIN OXIDE ETCHANT TE-100

SECTION I: - PRODUCT IDENTIFICATION Revised 7/02

Emergency # Chemtrec: 1-800-424-9300

Product Name: Copper Etchant 100/200 - Tin Oxide Etchant TE-100

Formula: HCl/FeCl₃ in H₂O

CAS No.: mixture see below

Product Codes: CE-100/200

Synonyms: ITO Etchant

PRECAUTIONARY LABELING

BAKER **SAF-T-DATA SYSTEM**

HEALTH FLAMMABILITY REACTIVITY CONTACT

3 0 2 3

SEVERE NONE MODERATE SEVERE

Laboratory Protective Equipment: Goggles & Shield, Lab Coat & Apron, Vent Hood, Proper Gloves.

Precautionary Label **Statements: POISON! DANGER! CAUSES BURNS!**

MAY BE FATAL IF SWALLOWED OR INHALED Do not get in eyes, on skin, on clothing.

Do not breathe vapor. Keep in tightly closed container. Use with adequate ventilation. Wash thoroughly after handling.

SECTION II- HAZARDOUS COMPONENTS

Components: % CAS#

Ferric Chloride FeCl₃: 25-30% 7705-08-0

Hydrogen Chloride: 1-5% 7647-01-0

SECTION III- PHYSICAL DATA

Boiling Point: N/A **Melting Point:** N/A

Vapor Pressure (mmHg): N/A **Vapor Density(air=1):** 1.3

Specific Gravity (H₂O=1): 1.19

Evaporation Rate: N/A

Solubility (H₂O): Complete (in all portions)

% Volatiles by Volume: 100

Appearance & Odor: Colorless liquid with hydrogen chloride odor.

SECTION IV- FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **NFPA 704M Rating:** 3-0-0

Flammable Limits: Upper - N/A% Lower- N/A%

Fire Extinguishing Media: Use extinguishing media appropriate for surrounding fire.

Special Fire Fighting Procedures: Firefighters should wear proper protective equipment and self-contained (positive pressure if available) breathing apparatus with full-face piece. Move exposed containers from fire area, if it can be done without risk. Use water to keep exposed containers cool; do not get water inside containers.

Unusual Fire & Explosion Hazards: Closed containers exposed to heat may explode.

Toxic Gases Produced: Hydrogen chloride, hydrogen gas.

SECTION V- HEALTH HAZARD DATA:

PEL and TLV listed denote ceiling limit.

Ferric Chloride (TLV/TWA) 900 mg/m³ (FeCl₃)

Hydrochloric Acid (TLV/TWA) 7 mg/m³ (5ppm) (HCl)

Permissible Exposure Limit (PEL): 7 mg/m³ (5ppm) (HCl)

Toxicity: LD₅₀ (ipr-mouse) (mg/kg) 40 (HCl)

LD₅₀ (oral-rabbit) (mg/kg) 900 (HCl)

LC₅₀ (inhl-rat-1H) (ppm) 3124 (HCl)

Carcinogenicity: NTP: No IARC: No Z List: No OSHA reg: No

Effects of Overexposure: Inhalation of vapors may cause pulmonary edema, circulatory system collapse, damage to upper respiratory system, collapse. Inhalation of vapors may cause coughing and difficult breathing. Liquid may cause severe burns to skin and eyes.

Effects of Ingestion: Ingestion is harmful and may be fatal. May cause severe burning to mouth and stomach. May cause nausea and vomiting.

Medical Conditions Generally Aggravated By Exposure: None identified.

Routes of Entry: Ingestion, inhalation, skin contact and eye contact.

Emergency and First Aid Procedures: CALL A PHYSICIAN. If swallowed do not induce vomiting; If conscious, give water, milk or milk of magnesia.

If inhaled remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen.

In case of contact immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use.

Toxicity test results and safety and health effects are based on the solute.

SECTION VI- REACTIVITY DATA:

Stability: Stable **Hazardous Polymerization:** Will not occur

Incompatibles: Most common metals, strong bases, metal oxides, amines and carbonates.

Decomposition Products: Hydrogen chloride.

SECTION VII- SPILL AND DISPOSAL PROCEDURES:

Steps to be taken in event of spill or discharge: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

Disposal Procedure: Dispose in accordance with all applicable federal, state and local environmental regulations. EPA Hazardous waste number: D002 (corrosive waste).

SECTION VIII: INDUSTRIAL PROTECTIVE EQUIPMENT

Ventilation: Use general or local exhaust ventilation to meet TLV requirements.

Respiratory Protection: Respiratory required if airborne concentration exceeds TLU. Pt concentrations up to 100 ppm, a chemical cartridge respirator with acid cartridge is recommended. Above this level, a self-contained breathing apparatus is recommended.

Eye/Skin Protection: Safety goggles and face shield, uniform, protective suit and acid-resistant gloves are recommended.

SECTION IX- STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA™ Storage Color Code: White

Special Precautions: Keep container tightly closed. Store on corrosion-proof area.

SECTION X- TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC D.O.T.

Proper Shipping Name: Ferric Chloride Solution

Hazard Class: 8

UN/NA: UN2582

Labels: Corrosive

Reportable Quantity: 5000 lbs.

INTERNATIONAL (I.M.O.)

Proper Shipping Name: Ferric Chloride Solution

Hazard Class: 8

UN/NA: UN 2582

Labels: Corrosive

N/A- Not Applicable or Not Available

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

M.E. Hecht July 2002

Addendum to Material Safety Data Sheet

Regulatory Status

This addendum must not be detached from the MSDS. Identifies SARA 313 substances(s). Any copying or redistribution of the MSDS must include a copy of this addendum.

Hazard Categories for SARA

Section 311/312 Reporting

Acute Chronic Fire Pressure Reactive

Products or Components SARA EHS Sect.302 SARA Section 313 Chemicals CERCLA Sec.103 RCRA

of product. RQ (lbs.) Tpq (lbs.) Name List Chemical Category RQ (lbs.) Sec. 261.33

Hydrochloric Acid 5000 500 Yes No 5000 No

(7647-01-0)

Applicable Products:

PC Copper Etchant (CE-100, CE-200),

CRE-473, Iron Oxide Mask Etchant, TFP,

TFTN, Electroless Nickel Plating Strike,

PC Electroless Copper D, Bright Electroless

Tin Part B, TE-100

SARA Section 302 EHS RQ; Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355

SARA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity=10000 lbs.

SARA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA Sec. 103: Comprehensive Environmental Response. Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous Substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4

RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

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