

MATERIAL SAFETY DATA SHEET

I. MANUFACTURER INFORMATION:

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MSDS# TSL-301

II. MATERIAL IDENTIFICATION – UNKNOWN NUMBERS 108-118, Custom Series 200 & 400

Nickel & Cobalt for Custom Unknowns:

Qualitative analysis unknowns are designed for individual student use in chemistry laboratory courses. Each package contains between 0.20 grams and 0.40 grams of solid chemical (pure or mixture) which is sealed in a small plastic vial bearing a code number. In typical use, the instructors of chemistry labs do not reveal the code number or the identity of the contents of any vial to students. Identity of each sample is known to the instructor or stockroom personnel by comparing the “Key” to the code numbers.

III. GROUP II CATIONS: INGREDIENTS, EXPOSURE LIMITS AND TOXICITY DATA

Please refer to the Key for the identification of cations for Unknown Numbers 108 – 118, Custom Series 400. The cations and corresponding raw materials are as follows:

| Cation | Ingredient | CAS | TWA | LD50- Oral | LD50- Dermal | National Fire Protective Association | | | |
|------------------|---------------------------------------|------------|-------------------------|---------------|-----------------|--------------------------------------|---|---|-----|
| | | | | | | H | F | R | |
| | | | mg/m ³ | mg/kg | mg/kg | | | | |
| Bi ³⁺ | Bi(OH) ₃ | 10361-43-0 | N/A | N/A | | 0 | 0 | | |
| Cu ²⁺ | CuCO ₃ Cu(OH) ₂ | 10269-69-1 | 1.0 (Cu) | 159 (rat) | | 2 | 0 | 0 | |
| Hg ²⁺ | HgO | 21908-53-2 | 0.05 (Hg) | 18 (rat) | 315 | 3 | 0 | 0 | Cor |
| Pb ²⁺ | PbCO ₃ | 598-63-0 | 0.15 (Pb) | N/A | | 1 | 0 | 0 | |
| Sb ³⁺ | Sb ₂ O ₃ | 1309-64-4 | 0.5 (Sb) | 7000 (rat) | | 0 | 0 | 0 | |
| Sn ⁴⁺ | SnCl ₄ •5H ₂ O | 10026-06-9 | 2 (Sn) | N/A | | 3 | 0 | 0 | Cor |
| Co | CoCO ₃ | 513-79-1 | 0.05 (Co) | 640 (rat) | | 1 | 0 | 2 | |
| Ni | NiO | 1313-99-1 | 1 (Ni) | 50 (mouse) | | 3 | 0 | 0 | |
| Cd | CdCO ₃ | 513-78-0 | 0.2mg Cd/m ³ | 50 (rat) | | | | | |

N/A = Not Available

Bi(OH)₃: Bismuth (III) hydroxide

CuCO₃: Copper (II) carbonate, basic; Cupric carbonate, basic

HgO: Mercury (II) Oxide; Mercuric Oxide, yellow

PbCO₃: Lead Carbonate

Sb₂O₃: Antimony oxide III; Antimony trioxide

SnCl₄•5H₂O: Tin (IV) chloride, pentahydrate; Stannic chloride, pentahydrate

CoCO₃: Cobalt Carbonate

NiO: Nickel oxide; Nickel monoxide

CdCO₃: Cadmium Carbonate

IV. HEALTH HAZARDS:

Due to the small amount of material in each package, the hazard associated with each package is minimal. This information is obtained from the MSDS of the individual raw materials and other reliable sources and may or may not be directly applicable to the small amount of the individual material or mixtures. The unknown vials are to be used under supervision of a chemist or trained laboratory instructor.

POTENTIAL HAZARD FROM ACUTE EXPOSURE

| Ingredient | Eye Contact | Ingestion | Inhalation | Skin | |
|--|--|--|---|---|-------------------------|
| | | | | Absorption | Contact |
| HgO | Irritant: Corrosive: Amount of damage depends on length of contact | Extremely dangerous. May be fatal | Very dangerous. May be fatal | Corrosive and a permeator Amount of damage depends on length of contact. | Irritation |
| PbCO ₃ | Irritation | Harmful: Very Dangerous | May be Harmful | May be Harmful | May cause Irritation |
| SnCl ₄ •5H ₂ O | Irritant: Corrosive: Amount of damage depends on length of contact | Harmful: Very Dangerous | Harmful: Very Dangerous | Harmful Corrosive and a permeator Amount of damage depends on length of contact | Irritant |
| Sb ₂ O ₃ | Irritation | Harmful | Harmful | Harmful | Irritation |
| Bi(OH) ₃ | No specific information | No specific information | No specific information | No specific information | No specific information |
| CuCO ₃ Cu(OH) ₂ | Irritant | Harmful: Very Dangerous | Harmful | May be Harmful | Irritant |
| CoCO ₃ Suspect carcinogen | Irritant | Toxic : May affect kidneys, lungs or thyroid | No specific information | No specific information | No specific information |
| NiO | Irritation or Burns | Nausea, vomiting; gastrointestinal irritation | Headache, coughing dizziness, difficult breathing; Upper respiratory irritation | No specific information | Irritation or Burns |
| CdCO ₃ Human carcinogen | Irritation | Swallowing may cause vomiting. Considered Toxic internally. | Avoid breathing dust. Wear suitable respirator. | No specific information | No specific information |

PUTTING THE HAZARD INTO PERSPECTIVE: Due to the small sample size, the individual unknowns present little hazard. HgO is present at approximately 0.20 grams in a two component unknown. It is estimated that 4 vials must be ingested for a 125 pound person to obtain a LD50 dose of 18 mg/kg body weight. As the number of components in an unknown increase, the amount of HgO per vial decreases.

CHRONIC HEALTH EFFECTS due to long term or repeated exposure:

Sb₂O₃ is a suspect carcinogen by ACGIH and a possible carcinogen by OSHA.

Lead and lead compounds (IARC Grp-2B) are listed by IARC as probably carcinogenic to humans based on sufficient animal data but inadequate human evidence. Adverse effects of lead on human reproduction, embryonic and fetal development and post-natal development have been reported.

V. FIRST AID MEASURES

Skin: Wash hands thoroughly after contact using soap and warm water. If spilled on clothing, flush

affected areas with water, remove contaminated clothing as soon as possible and wash before reuse.

Ingestion: Because of the small sample size (400 mg or less), most of the unknowns present little hazard. Rinse out the mouth with plenty of water. If ingested, drink several glasses of water and Do NOT induce vomiting for unknowns containing HgO and SnCl₄•5H₂O. Seek medical attention.

Eye Contact: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention.

Inhalation: Remove victim to a well ventilated area. Seek medical attention.

VI. PHYSICAL DATA, STABILITY AND REACTIVITY DATA

| Cation | MW | MP °C/°F | Stability | Flammability | Solubility in Cold Water | Comments |
|-------------------|--------|-----------------------|-----------|---------------|--------------------------|--|
| Bi ³⁺ | 260.02 | N/A | Stable | Non-Flammable | Very Slightly | |
| Cu ²⁺ | 221.11 | Decomposes 200/392 | Stable | Non-Flammable | Insoluble | Incompatible with acids, oxidizing agents. |
| Hg ²⁺ | 216.59 | Decomposes 500°C | Stable | Non-Flammable | Very Slightly | Incompatible with strong oxidizing agents. May be light sensitive. |
| Pb ²⁺ | 267.2 | Decomposes 400°C | Stable | Non-Flammable | Insoluble | Incompatible with strong oxidizing agents, strong acids. |
| Sn ³⁺ | 291.52 | 655/1211 | Stable | Non-Flammable | Insoluble | BP: 1425°C/2579°F Toxic fumes emitted when heated to decomposition. Incompatible with acids, bases, reducing agents. |
| Sn ⁴⁺ | 350.58 | 56/132.8 | Stable | Non-Flammable | Soluble | Decomposes with exposure to moist air or water. |
| CoCO ₃ | 118.94 | N/A | Stable | Non-Flammable | Insoluble in water | Liberates CO ₂ on contact with acids. |
| NiO | 74.71 | N/A | Stable | Non-Flammable | Negligible (<0.1%) | |
| CdCO ₃ | 172.42 | Decomposes 500°C | Stable | Non-Flammable | Insoluble in water | May generate cadmium oxide fumes in general fire. |

N/A = Not Available

Additional Comments:

Sb₂O₃ is considered somewhat reactive with reducing agents, acids, and alkalis.

VII. FIRE AND EXPLOSION HAZARDS

No fire or explosion hazards are known.

VIII. STORAGE AND DISPOSAL

Store in a well ventilated area and protect unknowns from light. Do not breathe dusts. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure. Keep vials closed when not in use. Wash thoroughly after handling. Dispose in accordance with Federal, State and Local regulations.

The information provided in the MSDS is based on available information which is believed to be accurate and reliable. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. We make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and assume no liability resulting from its use. We reserve the right to revise Material Safety Data Sheets periodically as new information becomes available.

The following sources were consulted:

1. Material Safety Data Sheets of the individual ingredients.
2. Sigma-Aldrich Library of Chemical Safety Data Ed. II; 1988

Practice good laboratory safety procedures when using chemicals.

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