Material Safety Data Sheet

Nicotine Salicylate
sc-219361

Hazard Alert Code Key:
- EXTREME
- HIGH
- MODERATE
- LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Nicotine Salicylate

STATEMENT OF HAZARDOUS NATURE

NFPA

SUPPLIER
Company: Santa Cruz Biotechnology, Inc.
2145 Delaware Ave
Santa Cruz, CA 95060
Telephone: 800.457.3801 or 831.457.3800
Emergency Tel: CHEMWATCH: From within the US and Canada: 877-715-9305
Emergency Tel: From outside the US and Canada: +800 2436 2255 (1-800-CHEMCALL) or call +613 9573 3112

PRODUCT USE
Salt of an alkaloid obtained from the dried leaves and stems of Nicotiana tobacum and Nicotiniana rustica. Used as an insecticide and fumigant.

SYNONYMS
C10-H14-N2.C7-H6-O3, "nicotine monosalicylate", Eudermol, alkaloid

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
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<tbody>
<tr>
<td>Flammability:</td>
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<td></td>
</tr>
<tr>
<td>Toxicity:</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Body Contact:</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Reactivity:</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chronic:</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS

1 of 13
CHRONIC HEALTH EFFECTS

There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. There is some evidence that human exposure to the material may result in developmental toxicity. This evidence is based on animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but
which are not secondary non-specific consequences of the other toxic effects.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.
Chronic exposure to salicylates produce problems with metabolism, central system disturbances, or kidney damage. Those with pre-existing damage to the eye, skin or kidney are especially at risk. Hypersensitive reactions can occur, especially in people with asthma. These symptoms include itchy wheals and other skin eruptions, an inflamed nose, shortness of breath and serious narrowing of the airways (which can even cause death). Chronic exposure to parabens by skin contact, ingestion or injection can cause hypersensitive reactions. There may be cross-sensitivity between different species, so people can develop allergic symptoms if they were sensitized by other chemicals. Symptoms include acute narrowing of the airways, hives (itchy wheal), swelling, running nose and blurred vision. There may be anaphylactic shock and rash.
Chronic nicotine poisoning may produce digestive and nutritional disturbances, peripheral vasoconstriction and a rise in blood pressure and rarely, amblyopia (a small area of visual loss at the centre of the visual field that slowly enlarges and can lead to complete blindness). Nicotine dependence remains controversial only in a diminishing number of schools. Tolerance may occur. Chronic exposure to nicotine may produce adverse effects on the developing foetus. Along with decreased birth weights, attention deficit disorders are more common in children whose mothers smoke cigarettes during pregnancy; nicotine has been shown to lead to analogous neurobehavioural abnormalities in animals exposed prenatally to nicotine. Nicotinic receptors are expressed early in the development of the nervous system beginning in the developing brainstem and later expressed in the diencephalon. It is quite possible that the interaction of nicotine with its receptors, during the prenatal period, is the basis of subsequent attention disorders. The formation of tobacco-specific nitrosamines results during processing and fermentation as a result of reaction between nicotine and exogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl moiety. Secondary amines may react in the acid conditions of the stomach with endogenous nitrates and nitrites. Nicotine may behave as a secondary amine due to its pyridyl mo

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>CAS RN</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>nicotine salicylate</td>
<td>29790-52-1</td>
<td>&gt;98</td>
</tr>
</tbody>
</table>

### Section 4 - FIRST AID MEASURES

#### SWALLOWED
- **IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.**
  - Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
    - For advice, contact a Poisons Information Center or a doctor.
    - Urgent hospital treatment is likely to be needed.
    - If conscious, give water to drink.
    - INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
    - NOTE: Wear a protective glove when inducing vomiting by mechanical means.
    - In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
    - If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
    - If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

#### EYE
- If this product comes in contact with the eyes:
  - Immediately hold eyelids apart and flush the eye continuously with running water.
  - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  - Continue flushing until advised to stop by the Poisons Information Center or a doctor, or for at least 15 minutes.
  - Transport to hospital or doctor without delay.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

#### SKIN
- If skin or hair contact occurs:
  - Immediately flush body and clothes with large amounts of water, using safety shower if available.
  - Quickly remove all contaminated clothing, including footwear.
  - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Center.
  - Transport to hospital, or doctor.

#### INHALED
- If fumes or combustion products are inhaled remove from contaminated area.
  - Lay patient down. Keep warm and rested.
  - Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
  - Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
  - If conscious, give water to drink.
  - Urgent hospital treatment is likely to be needed.
Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

- Treat symptomatically.
- For nicotine intoxication:
  - Administer 6 to 8 heaped teaspoons of activated charcoal, as a slurry, in water.
  - Because nicotine induces vomiting by stimulating the chemoreceptor trigger zones of the brainstem, it seems inadvisable to administer syrup of ipecac, which acts by the same mechanism.
  - Unless spontaneous emesis is vigorous and productive, gastric lavage with a 0.5% solution of tannic acid, or a 1:5000 solution of potassium permanganate. Use water if these solutions are not immediately available.
  - If nicotine is spilled on skin, wash thoroughly and IMMEDIATELY with diluted vinegar and / or cold running water. (Nicotine salts are less readily absorbed).
  - Administer artificial ventilation and oxygen therapy until spontaneous breathing is adequate or until the heart ceases to beat. Central respiratory stimulants are rarely if ever indicated. Keep airway clear. Profuse salivation may require continuous oral suction.
  - If severe or persistent, convulsions may be controlled with small intravenous doses of barbiturates or diazepam.
  - Most of the visceral manifestations can be controlled by various combinations of autonomic blocking drugs, such as atropine and phenoxybenzamine (Dibenzyline). Caramiphen (Parpanit) hydrochloride and diethazine (Diparcol) hydrochloride have been recommended in the experimental poisoning but may not be readily available.

GOSSELIN, SMITH & HODGE: Clinical Toxicology of Commercial Products, 5th Ed.

Nicotine undergoes a large first-pass effect during which the liver metabolises 80-89%. Smaller amounts are metabolised in the lung and kidney. Nicotine and its metabolites (cotinine and nicotine-1'-N-oxide) are excreted in the urine. At a pH of 5.5 or less, 23% is excreted unchanged. At a pH of 8, only 2% is excreted in the urine. The effect of urinary pH on total clearance is entirely due to changes in renal clearance. Blood cotinine levels, and possibly, saliva cotinine levels, are good measures of passive smoking. Tobacco is less toxic than expected from its nicotine content, among tobacco chewers. Apparently intestinal absorption of nicotine from tobacco is so slow that metabolic inactivation keeps pace with absorption.

for salicylate intoxication:
- Pending gastric lavage, use emetics such as syrup of ipecac or delay gastric emptying and absorption by swallowing a slurry of activated charcoal. Do not give ipecac after charcoal.
- Gastric lavage with water or perhaps sodium bicarbonate solution (3%-5%). Mild alkali delays salicylate absorption from the stomach and perhaps slightly from the duodenum.
- Saline catharsis with sodium or magnesium sulfate (15-30 gm in water).
- Take an immediate blood sample for an appraisal of the patients acid-base status. A pH determination on an anaerobic sample of arterial blood is best. An analysis of the plasma salicylate concentrations should be made at the same time. Laboratory controls are almost essential for the proper management of severe salicylism.
- In the presence of an established acidosis, alkali therapy is essential, but at least in an adult, alkali should be withheld until its need is demonstrated by chemical analysis. The intensity of treatment depends on the intensity of acidosis. In the presence of vomiting, intravenous sodium bicarbonate is the most satisfactory of all alkali therapy.
- Correct dehydration and hypoglycemia (if present) by the intravenous administration of glucose in water or in isotonic saline. The administration of glucose may also serve to remedy ketosis which is often seen in poisoned children.
- Even patients without hypoglycemia, infusions of glucose adequate to produce distinct hyperglycemia are recommended to prevent glucose depletion in the brain. This recommendation is based on impressive experimental data in animals.
- Renal function should be supported by correcting dehydration and incipient shock. Overhydration is not justified. An alkaline urine should be maintained by the administration of alkali if necessary with care to prevent a severe systemic alkalosis. As long as urine remains alkaline (pH above 7.5), administration of an osmotic diuretic such as mannitol or perhaps THAM is useful, but one must be careful to avoid hypokalemia. Supplements of potassium should be included in parenteral fluids.
- Small doses of barbiturates, diazepam, paraldehyde, or perhaps other sedatives (but probably not morphine) may be required to suppress extreme restlessness and convulsions.
- For hyperpyrexia, use sponge baths. The presence of petechiae or other signs of hemorrhagic tendency calls for large Vitamin K dose and perhaps ascorbic acid. Minor transfusions may be necessary since bleeding in salicylism is not always due to a prothrombin effect.
- Haemodialysis and hemoperfusion have proved useful in salicylate poisoning, as have peritoneal dialysis and exchange transfusions, but alkaline diuretic therapy is probably sufficient except in fulminating cases.

The mechanism of the toxic effect involves metabolic acidosis, respiratory alkalosis, hypoglycemia, and potassium depletion. Salicylate poisoning is characterized by extreme acid-base disturbances, electrolyte disturbances and decreased levels of consciousness. There are differences between acute and chronic toxicity and a varying clinical picture which is dependent on the age of the patient and their kidney function. The major feature of poisoning is metabolic acidosis due to "uncoupling of oxidative phosphorylation" which produces an increased metabolic rate, increased oxygen consumption, increased formation of carbon dioxide, increased heat production and increased utilization of glucose. Direct stimulation of the respiratory center leads to hyperventilation and respiratory alkalosis. This leads to compensatory increased renal excretion of bicarbonate which contributes to the metabolic acidosis which may coexist or develop subsequently. Hypoglycemia may occur as a result of increased glucose demand, increased rates of tissue glycolysis, and impaired rate of glucose synthesis. NOTE: Tissue glucose levels may be lower than plasma levels. Hyperpyrexia may occur due to increased glycolysis. Potassium depletion occurs as a result of increased renal excretion as well as intracellular movement of potassium. Salicylates competitively inhibit vitamin K dependent synthesis of factors II, VII, IX, X and in addition, may produce a mild dose dependent hepatitis.

Salicylates are bound to albumin. The extent of protein binding is concentration dependent (and falls with higher blood levels). This, and the effects of acidosis, decreasing ionization, means that the volume of distribution increases markedly in overdose as does CNS penetration. The extent of protein binding (50-80%) and the rate of metabolism are concentration dependent. Hepatic clearance has zero order kinetics and thus the therapeutic half-life of 2-4.5 hours but the half-life in overdose is 18-36 hours. Renal excretion is the most important route in overdose. Thus when the salicylate concentrations are in the toxic range there is increased tissue distribution and impaired clearance of the drug.
Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG): Negligible
Upper Explosive Limit (%): Not available
Specific Gravity (water=1): Not available
Lower Explosive Limit (%): Not available

EXTINGUISHING MEDIA
- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Dry dust can be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
- Build-up of electrostatic charge may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
- May emit poisonous fumes.

FIRE INCOMPATIBILITY
- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION
- Glasses:
  - Full face-shield.
- Gloves:
- Respirator:
  - Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

MAJOR SPILLS
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
PROTECTIVE ACTIONS FOR SPILL

- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

PROTECTIVE ACTION ZONE

- Isolation Distance
  - Wind direction
  - Isolation Distance
  - Initial Isolation Zone

- Wind distance
- Evacuation direction
- Half downwind distance

- From IERG (Canada/Australia)
  - Isolation Distance: 25 meters
  - Downwind Protection Distance: 250 meters

FOOTNOTES

1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.

2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.

3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.

4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrycan or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.


6 IERG information is derived from CANUTEC - Transport Canada.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

- AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

- AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

- AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow material to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
Avoid physical damage to containers.
Always wash hands with soap and water after handling.
Work clothes should be laundered separately.
Launder contaminated clothing before re-use.
Use good occupational work practice.
Observe manufacturer's storing and handling recommendations.
Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
Do NOT cut, drill, grind or weld such containers.
In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorization or permit.

RECOMMENDED STORAGE METHODS
- Lined metal can, Lined metal pail/drum
- Plastic pail
- Polyliner drum
- Packing as recommended by manufacturer.
- Check all containers are clearly labeled and free from leaks.

For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges may be used.

- Where combination packages are used, and the inner packages are of glass, there must be sufficient inert cushioning material in contact with inner and outer packages *.
- In addition, where inner packagings are glass and contain liquids of packing group I and II there must be sufficient inert absorbent to absorb any spillage *.
- * unless the outer packaging is a close fitting molded plastic box and the substances are not incompatible with the plastic. All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

X: Must not be stored together
O: May be stored together with specific preventions
+: May be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS
The following materials had no OELs on our records
- nicotine salicylate: CAS:29790-52-1

MATERIAL DATA
NICOTINE SALICYLATE:
- For nicotine:
  At the TLV-TWA an 8-hour intake of nicotine received by inhalation is calculated to be 0.07 mg/kg/day based on the metabolism and controlled dosing of human volunteers. Chronic studies using rodents have found a no-observed-adverse-effect level (NOAEL) of 1.14 mg/kg/day.
  Absorption through intact human skin has produced serious (and even life threatening) intoxication.
  CEL TWA: 0.5 mg/m3 as nicotine (analogue for nicotine)
PERSONAL PROTECTION

Consult your EHS staff for recommendations

EYE

- Chemical goggles.
- Full face shield.
- Contact lenses pose a special hazard; soft contact lenses may absorb irritants and all lenses concentrate them.

HANDS/FEET

- Elbow length PVC gloves.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
  - frequency and duration of contact,
  - chemical resistance of glove material,
  - glove thickness and
  - dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

- Overalls.
- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.
- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

RESPIRATOR

<table>
<thead>
<tr>
<th>Protection Factor</th>
<th>Half-Face Respirator</th>
<th>Full-Face Respirator</th>
<th>Powered Air Respirator</th>
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</thead>
<tbody>
<tr>
<td>10 x PEL</td>
<td>P1</td>
<td>-</td>
<td>PAPR-P1</td>
</tr>
<tr>
<td>50 x PEL</td>
<td>Air-line*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>100 x PEL</td>
<td>Air-line**</td>
<td>P2</td>
<td>PAPR-P2</td>
</tr>
<tr>
<td>100+ x PEL</td>
<td>-</td>
<td>P3</td>
<td>PAPR-P3</td>
</tr>
</tbody>
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* - Negative pressure demand ** - Continuous flow

Explanation of Respirator Codes:
Class 1 low to medium absorption capacity filters.
Class 2 medium absorption capacity filters.
Class 3 high absorption capacity filters.
PAPR Powered Air Purifying Respirator (positive pressure) cartridge.
Type A for use against certain organic gases and vapors.
Type AX for use against low boiling point organic compounds (less than 65°C).
Type B for use against certain inorganic gases and other acid gases and vapors.
Type E for use against sulfur dioxide and other acid gases and vapors.
Type K for use against ammonia and organic ammonia derivatives
Class P1 intended for use against mechanically generated particulates of sizes most commonly encountered in industry, e.g. asbestos, silica.
Class P2 intended for use against both mechanically and thermally generated particulates, e.g. metal fume. Class P3 intended for use against all particulates containing highly toxic materials, e.g. beryllium.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:
  (a): particle dust respirators, if necessary, combined with an absorption cartridge;
  (b): filter respirators with absorption cartridge or canister of the right type;
  (c): fresh-air hoods or masks
- Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to efficiently remove the contaminant.

<table>
<thead>
<tr>
<th>Type of Contaminant:</th>
<th>Air Speed:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct spray, spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td>
<td>1-2.5 m/s (200-500 f/min.)</td>
</tr>
<tr>
<td>Grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).</td>
<td>2.5-10 m/s (500-2000 f/min.)</td>
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Within each range the appropriate value depends on:

<table>
<thead>
<tr>
<th>Lower end of the range</th>
<th>Upper end of the range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Room air currents minimal or favorable to capture</td>
<td>1: Disturbing room air currents</td>
</tr>
<tr>
<td>2: Contaminants of low toxicity or of nuisance value only</td>
<td>2: Contaminants of high toxicity</td>
</tr>
<tr>
<td>3: Intermittent, low production.</td>
<td>3: High production, heavy use</td>
</tr>
<tr>
<td>4: Large hood or large air mass in motion</td>
<td>4: Small hood-local control only</td>
</tr>
</tbody>
</table>

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

**PHYSICAL PROPERTIES**

Solid. Mixes with water.

<table>
<thead>
<tr>
<th>State</th>
<th>Divided solid</th>
<th>Molecular Weight</th>
<th>300.39</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting Range (°F)</td>
<td>244.4</td>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Boiling Range (°F)</td>
<td>Not available</td>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
</tr>
<tr>
<td>Flash Point (°F)</td>
<td>Not available</td>
<td>pH (1% solution)</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition Temp (°F)</td>
<td>Not Available</td>
<td>pH (as supplied)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Autoignition Temp (°F)</td>
<td>Not available</td>
<td>Vapour Pressure (mmHG)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not available</td>
<td>Specific Gravity (water=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not available</td>
<td>Relative Vapor Density (air=1)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Volatile Component (%vol)</td>
<td>Negligible</td>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**APPEARANCE**

White crystalline powder; mixes with water and alcohol

**Section 10 - CHEMICAL STABILITY**
CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

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**Section 11 - TOXICOLOGICAL INFORMATION**

nicotine salicylate

**TOXICITY AND IRRITATION**

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

- For nicotine:

  Nicotine is acutely toxic by all routes of exposure (oral, dermal, and inhalation). The LD50 of nicotine is 50 mg/kg for rats and 3 mg/kg for mice. A dose of 40-60 mg can be a lethal dosage for adult human beings and doses as low as 1-4 mg can be associated with toxic effects in some individuals. Nicotine is an agonist at nicotinic receptors in the peripheral and central nervous system.

  In a subchronic oral rat toxicity study conducted with nicotine hydrogen tartrate, the substance was administered to pregnant and non-pregnant female rats in the drinking water for 10 days at doses equivalent to 1.25 and 2.5 mg/kg/day. The animals exhibited mild fatty change, mild focal necrosis and mild dark cell change, with effects on the mitochondria, in a dose proportional manner. Effects at the lower dose were not statistically significant, so the NOAEL was identified as 1.25 mg/kg/day; the LOAEL was identified as 2.5 mg/kg/day.

  According to various authorities, nicotine is neither an initiator nor a promoter of tumors in rodents.

  No significant acute toxicological data identified in literature search.

  Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

---

**Section 12 - ECOLOGICAL INFORMATION**

Refer to data for ingredients, which follows:

**NICOTINE SALICYLATE:**

- Toxic to aquatic organisms.

- Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

  Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

  - May cause long-term adverse effects in the aquatic environment.

  - For nicotine:

    Environmental fate:
    Terrestrial fate: If released to soil, nicotine may biodegrade to a variety of different products including oxynicotine, 3-pyridylmethyl ketone, 2,3'-dipyridyl, N-methylmyosmine and a purple crystalline pigment. In moist soil chemical hydrolysis and volatilisation are not expected to be important fate processes. Under alkaline condition, nicotine should be highly mobile.

    Aquatic fate: If released to water, nicotine may biodegrade. This compound is not expected to undergo chemical hydrolysis, bioaccumulate significantly in aquatic organisms or volatilise. Under alkaline conditions adsorption to suspended solids and sediments is not expected to be significant. Slight potential exists for photolysis.

    Atmospheric fate: If released to air nicotine is expected to degrade rather quickly in the presence of light and air. A resinous product may form. In the ambient atmosphere, nicotine may react with photochemically generated hydroxyl radicals (vapor phase t 1/2 1 day) or be removed by wet deposition. Slight potential exists for direct photolysis, since it adsorbs UV light only weakly above 290 nm.

  - Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.

### Source of unsaturated substances | Unsaturated substances (Reactive Emissions) | Major Stable Products produced following reaction with ozone.
---

**Occupants (exhaled breath, ski oils, personal care products)**

- Isoprene, nitric oxide, squalene, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidation products

**Soft woods, wood flooring, including cypress, cedar and silver fir boards, houseplants**

- Isoprene, limonene, alpha-pinene, other terpenes and sesquiterpenes

**Carpets and carpet backing**

- 4-Phenylcyclohexene, 4-vinylcyclohexene, styrene, 2-ethylhexyl acrylate, unsaturated fatty acids and esters

**Linoleum and paints/polishes containing linseed oil**

- Linoleic acid, linolenic acid

**Latex paint**

- Residual monomers

**Nicotine**

- Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, 6MHQ, geranyl acetone, 4OPA, formaldehyde, nonanol, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid.
Certain cleaning products, polishes, waxes, air fresheners
Limonene, alpha-pinene, terpinolene, alpha-terpineol, linalool, linalyl acetate and other terpenoids, longifolene and other sesquiterpenes
Formaldehyde, acetaldehyde, glycoaldehyde, formic acid, acetic acid, hydrogen and organic peroxides, acetone, benzaldehyde, 4-hydroxy-4-methyl-5-hexen-1-ol, 5-ethenyl-dihydro-5-methyl-2(3H)-furanone, 4-AMC, SOAs including ultrafine particles

Natural rubber adhesive
Isoprene, terpenes
Formaldehyde, methacrolein, methyl vinyl ketone

Photocopier toner, printed paper, styrene polymers
Styrene
Formaldehyde, benzaldehyde

Environmental tobacco smoke
Styrene, acrolein, nicotine
Formaldehyde, benzaldehyde, hexanal, glyoxal, N-methylformamide, nicotinaldehyde, cotinine

Soiled clothing, fabrics, bedding
Squalene, unsaturated sterols, oleic acid and other saturated fatty acids
Acetone, geranyl acetone, 6MHQ, 4OPA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid

Soiled particle filters
Unsaturated fatty acids from plant waxes, leaf litter, and other vegetative debris; soot; diesel particles
Formaldehyde, nonanal, and other aldehydes; azelaic acid; nonanoic acid; 9-oxo-nonanoic acid and other oxo-acids; compounds with mixed functional groups (=O, -OH, and -COOH)

Ventilation ducts and duct liners
Unsaturated fatty acids and esters, unsaturated oils, neoprene
C5 to C10 aldehydes

"Urban grime"
Polycyclic aromatic hydrocarbons
Oxidized polycyclic aromatic hydrocarbons

Perfumes, colognes, essential oils (e.g. lavender, eucalyptus, tea tree)
Limonene, alpha-pinene, linalool, linalyl acetate, terpinene-4-ol, gamma-terpinene
Formaldehyde, 4-AMC, acetone, 4-hydroxy-4-methyl-5-hexen-1-ol, 5-ethenyl-dihydro-5-methyl-2(3H) furanone, SOAs including ultrafine particles

Overall home emissions
Limonene, alpha-pinene, styrene
Formaldehyde, 4-AMC, pinonaldehyde, acetone, pinic acid, pinonic acid, formic acid, benzaldehyde, SOAs including ultrafine particles

Abbreviations: 4-AMC, 4-acetyl-1-methylcyclohexene; 6MHQ, 6-methyl-5-heptene-2-one; 4OPA, 4-oxopentanal, SOA, Secondary Organic Aerosols
Reference: Charles J Weschler; Environmental Helath Perspectives, Vol 114, October 2006.
■ DO NOT discharge into sewer or waterways.

**Section 13 - DISPOSAL CONSIDERATIONS**

**Disposal Instructions**
All waste must be handled in accordance with local, state and federal regulations.

Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

**Section 14 - TRANSPORTATION INFORMATION**

DOT:
Section 15 - REGULATORY INFORMATION

REGULATIONS

Nicotine salicylate (CAS: 29790-52-1) is found on the following regulatory lists:

- "US - Massachusetts Oil & Hazardous Material List"
- "US - Vermont Hazardous Constituents"
- "US - Vermont Hazardous Waste - Acutely Hazardous Wastes"
- "US - Washington Discarded Chemical Products List - "P" Chemical Products"
- "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides"
- "US DOE Temporary Emergency Exposure Limits (TEELs)"
- "US EPCRA Section 313 Chemical List"
- "US List of Lists - Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act"
- "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261"
- "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Cumulative effects may result following exposure*.
- Limited evidence of a carcinogenic effect*.
- May be harmful to the fetus/embryo*.

* (limited evidence).

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- Classification of the mixture and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
- A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.
- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the
reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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