MATERIAL SAFETY DATA SHEET
Permount Solution

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STATEMENT OF HAZARDOUS NATURE

Hazardous according to criteria of Worksafe Australia

COMPANY DETAILS

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IDENTIFICATION SECTION

Product Name	Permount Mounting Medium
Other Names	
Product Code	IA019, IA0195
U.N. Number	UN1993
Dangerous Goods Class and Subsidiary Risk	3
Hazchem Code	3[Y]E
Poison Schedule	None allocated
Use	A mounting medium for microscopy

Physical Description and Properties

Appearance	Yellow liquid
Boiling Point/Melting Point	No data
Vapour Pressure	No data
Specific Gravity	No data
Flash Point	7^{o}C
Flammability Limits	Upper limit 6.7; lower limit 1.4
Solubility in water	Insoluble

Other Properties

Ingredients

Chemical Name	CAS Number	Proportion
Pinene Resin (Alpha Pinene)	80-56-8	57.4%
Toluenenene Polymer (Toluene)	108-88-3	41.6%
2,6-Di-Tert-Butyl-P-Cresol	128-37-0	1.0%

HEALTH HAZARD INFORMATION

Health Effects:

Acute

Swallowed: The Alpha-Pinene component (57.4%) is a narcotic. It may cause burning, nausea, vomiting, diarrhea, dysuria, hematuria, unconsciousness, shallow respiration and convulsions. Aspiration may cause direct lung irritation resulting in pulmonary edema and hemorrhage. Anuria, pulmonary edema and bronchial pneumonia may complicate recovery.
The Toluene component (41.6%) is a narcotic. It may cause a burning sensation in the epigastrium and abdominal spasms. Aspiration of the liquid into the lungs may cause coughing, gagging, distress, acute hemorrhagic pneumonitis, and rapidly developing pulmonary edema. The approximate lethal dose in humans is 15-30mL.
The 2,6-Di-Tert-Butyl-P-Cresol component (1%) may cause nausea, vomiting, epigastric cramping, grastritus, generalised weakness, confusion, dizziness, and brief loss of consciousness. Sensitisation and allergic anaphylatic reactions are possible. Allergic dermatitis has been reported with acute flares of vesicular dermatitis. Positive sequential vascular responses hava also been reported with intensification of rhinitis and asthma, diaphoresis, somnolence, headaches, retrosternal pain radiating to the back, flushing, and conjunctival suffusion.

Eye: The Alpha-Pinene component (57.4%) is corrosive. The liquid is highly discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/or other transient eye damage/ulceration.
The Toluene component (41.6%) is an irritant. The liquid produces a high level of eye discomfort and is capable of causing pain and severe conjunctivitis. Corneal injury may develop, with possible permanent impairment of vision, if not promptly and adequately treated. The vapour is discomforting to the eyes if exposure is prolonged. The material may produce severe irritation to the eye casuing pronouned inflammation.
The 2,6-Di-Tert-Butyl-P-Cresol component (1%) is an irritant. The material may produce moderate eye irritation leading to inflammation.

Skin: The Alpha-Pinene component (57.4%) is an irritant. Contact with the liquid may cause irritation and may be absorbed to cause headache, dizziness, confusion, stupefaction, coma and death.
The Toluene component (41.6%) is an irritant. Contact with the liquid may cause irritation. Vapours may cause drying. Skin absorption does occur, but it is generally too slow to produce signs of acute systemic toxicity.
The 2,6-Di-Tert-Butyl-P-Cresol component (1%) may cause irritation, urticarial reactions, and eczematous dermatitis. Sensitisation reactions may occur in previously exposed individuals.

Inhaled: The vapour of the Alpha-Pinene component (57.4%) is discomforting to the upper respiratory tract and lungs. Inhalation hazard is increased at higher temperatures. Inhalation of high concentrations for prolonged periods may cause dizziness, headache, nausea, vomiting and coma.
The Toluene component (41.6%) is an irritant/narcotic/neurotoxin. 2000ppm immediately dangerous to life or health. Odour detection may be insufficient for warning due to olfactory fatigue. Exposure to 100ppm may cause irritation. 200-600ppm for up to 8 hours cased fatigue, weakness, confusion, headache, nausea, impaired co-ordination and reaction time, paresthesias of the skin, euphoria, dizziness, and dilated pupils. 800ppm caused rapid irritation, nasal mucous secretion, metallic taste, drowsiness, and impaired balance. After effects including nervousness, muscular fatigue, and insomnia lasted for several days. A worker found unconscious after exposure to high vapour concen-trations for 18 hours developed hepatic and renal damage with myoglobinuria. Recovery was completed within 6 months. Hematologic effects occur rarely with exposure to high concentrations. Death may be due to respiratory failure or ventricular fibrillation.

Chronic: Prolonged or repeated exposure to toluene may cause mucous membrane irritation, vomiting, insomnia, nosebleeds, chest pains, euphoria, headache, vertigo, nausea, anorexia, momentary loss of memory, loss of coordination and impairment of reaction time, tinnitus, impaired speech, vision and/or hearing, alcohol intolerance, and petechiae and abnormal bleeding. Examination of workers exposed to 100ppm revealed hepatomegaly, mild macrocytoosis, moderate erythropenia, and absolute lymphocytosis but no leukopenia. Other workers exposed to toluene fumes developed leukopenia and especially neutropenia. Within 6 months, they showed decreased prothrombin level and increased coagulation time. Periodontal effects were also noted. Volunteers exposed to 200ppm for 6 hours/day for 2 days showed significant increase in heart rate. Cardiac sensitisation may occur and may result in cardiac arrest due to ventricular fibrillationl. Repeated inhalation to the point of euphoria has caused irreversible encephalopathy with cerebellar ataxia, rhythmic limb movements, disequilibrium, bizarre behaviour, emotional lability, optic atrophy, and diffuse cerebral atrophy. Other neuropsychiatric effects may include dizziness, syncope, paresthesias, peripheral neuropathy, hallucinations, lethargy, and coma. Intentional sniffing can produce renal tubular defects with metabolic acidosis, electrolyte abnormalities and potassium loss. Severe muscle weakness leading to limb paralysis and cardiac arrhythmias may result from the hypokalemia; however, sensory function and tendon reflexes are not impaired. Gastrointestinal effects may include abdominal pain, nausea, vomiting, and hematemesis. Chromosome changes were observed in some workers up to two years after cessation of exposure to toluene. Women occupationally exposed to toluene have reported menstrual disorders, underweight offspring who did not nurse well, and foetal asphyxia. One case study indicated toluene apparently crossed the placenta and created cerebellar damage in an unborn infant. Dysmenorrhea has been reported in women occupationally exposed to toluene levels of 60-100ppm. Prolonged or repeated contact with the liquid may cause defatting of the skin with a dry fissured dermatitis
Chronic exposure to Alpha-Pinene may cause kidney and bladder damage, chronic nephritis with albuminuria and hematuria. Contact with the liquid may cause determitis and may be absorbed to cause liver and kidney damage. Repeated or prolonged contact with vapours may cause conjunctivitis.
Chronic exposure to 2,6-Di-Tert-Butyl-P-Cresol may cause an allergic skin response with eczematous dermatitis. A cutaneous, urticarial, disseminated eruption has been reported.

First Aid:

Swallowed: Treat symptomatically and supportively. Get medical attention.

Eye: Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15 - 20 minutes). Get medical attention immediately.

Skin: Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15 - 20 minutes).Get medical attention immediately.

Inhaled: Remove from exposure area to fresh air immediately. Apply artificial respiration if not breathing. Maintain airway, blood pressure and respiration. Keep warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

First Aid Facilities: Where there is any possibility that an employee’s eyes and/or skin may be exposed to this substance, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

Advice to Doctor

Following acute or short term repeated exposures to toluene:
1. Toluene is absorbed across to alveolar barrier, the blood/air mixture being 11.2/15.6 (at 37 deg. C). The order of toluene, in expired breath, is of the order of 18ppm following sustained exposure to 100ppm. The tissue/blood proportion is 1/3 except in adipose where the proportion is 8/10.
2. Metabolism by microsomal mono-oxygenation, results in the production of hippuric acid. This may be detected in the urine in amounts between 0.5 and 2.5g/24hours which represents, on average 0.8g/g of creatinine. The biological half life of hippuric acid is in the order of 1-2 hours.
3. Primary threat to life from ingestion and/or inhalation, is respiratory failure.
4. Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 <50mm Hg or pCO2 >50mm Hg) should be intubated.
5. Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardias monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
6. A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumathorax.
7. Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
8. Lavage is indicated in patients sho require decontamination; ensure use of cuffed endotracheal tube in adult patients. [Ellenhorn and Barceloux: Medical Toxicology]
In acute poisonings by essential oils the stomach should be emptied by aspiration and lavage. Give a saline purgative such as sodium sulfate (30g in 250mL water) unless catharsis is already present. Demulcent drinks may also be given. Large volumes of fluid should be given provided renal function is adequate. [MARTINDALE: The Extra Pharmacopoeia, 28th Ed.]

PRECAUTIONS FOR USE

Exposure Standards: Alpha-Pinene (57.4%): CEL TWA 100ppm, 550mg/m3
Toluene (41.6%) ES TWA: 100ppm, 377mg/m3; STEL: 150ppm, 565mg/m3
2,6-Di-Tert-Butyl-P-Cresol (1%) TLV TWA: 10mg/m3 A4

Engineering Controls: Provide local exhaust or precess enclosure ventilation to meet published exposure limits.

Personal Protection: Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in continuous-flow mode. Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode. Employee must wear appropriate protective (impervious) clothing and equipment, appropriate protective gloves and splash-proof or dust-resistant safety goggles and a faceshield to prevent contact with this substance.

Flammability: Dangerous fire hazard when exposed to heat, flame or shock.

SAFE HANDLING INFORMATION

Storage and Transport: UN1993. DG Class 3. Flammable liquids n.o.s. (contains toluene)

Spills and Disposal: Absorb with vermiculite or other suitable material. Place in a suitable container (plastic), for later disposal.

Fire/Explosion Hazard: Firefighting media: dry chemical, carbon dioxide, water, spray or regular foam. For larger fires, use water spray, fog or regular foam. Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Avoid breathing vapours, keep upwind.

OTHER INFORMATION

Incompatibilities (Materials to avoid)

Toluene:
allyl chloride + dichloroethyl aluminium of ethylaluminium sesquichichloride: possible explosion
bromide trifluoride (solid): violent reaction
dinitrogen tetrafluoride: forms explosive mixture
mineral acids (strong): incompatible
nitric acid: vigorous reaction
nitric acid + sulfuric acid: violent decomposition possible
nitrogen tetroxide: explosive reaction
oxidisers (strong): fire and explosion hazard
plastics, rubber + coatings: may be attacked
silver perchlorate: forms shock-sensitive mixture
sulfur dichloride: violent reaction, greatly accelerated in the presence of iron or ferric chloride
sulfuric acid: exothermic reaction
tetranitromethane: forms explosive mixture
uranium hexafluoride: violent reaction
Alpha-Pinene:
nitrosyl perchlorate: reaction is explosive
oxidisers: reaction may be violent

Animal Toxicity Data:

LC50 inhalation-rat 49g/m3 4 hours
LC50 inhalation-mouse 400ppm/24 hours
LC50 inhalation-mammal 30g/m3
LD50 skin-rabbit 12124mg/kg
LD50 oral-rat 636mg/kg
LD50 oral-mammal 4g/kg
LD50 subcutaneous-mouse 2250mg/kg
LD50 intravenous-rat 1960mg/kg
LD50 intraperitoneal-guinea pig 500mg/kg
LD50 intraperitoneal-rat 1332mg/kg
LD50 intraperitoneal-mouse 59mg/kg
Reproductive effects have been reported in animals.
500mg/24 hours skin-rabbit moderate
2,6-Di-tert-butyl-p-cresol was tested for carcinogenicity in mice and rats by oral administration in the diet. Mice showed an increased incidence pulmonary tumors in low dose females. In rats an increased incidence of pituitary adenomas was observed in female rats at the lower dose level.
Repeated application of toluene to rabbit skin produced slight to moderate irritation and slight necrosis. Topical application of 10mg/kg produced an increase in plasmic and lymphoid reticular cells in bone marrow of rats, while 1g/kg had no effect.
2,6,-Di-tert-butyl-p-cresol is a limited animal carcinogen. A no observable effect level of 25mg/kg has been determined in rats. Animal studies have reported hemorrhaging into the pleural and peritoneal cavities, and hemorrhage of the epididymis, testes, naval cavity and pancreas, damage to the alveolar epithelium, and acute hepatic injury with necrosis. Animal studies have reported decreases in growth rate and body weight, liver changes, hepatocellular and pituitary adenomas, benign and malignant liver tumours, alveolar epithelium damage, lung tumours, and haemorrhage or the retina. Offspring of rats given bht have developed hepatocellular adenomas and carcinomas.