MATERIAL SAFETY DATA SHEET
SDS/MSDS

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

NICKEL SULPHAMATE SOLUTION

OTHER NAMES

H4-N2-Ni-O6-S2, (H2NSO3)2Ni.4H2O, "nickel sulphamate"

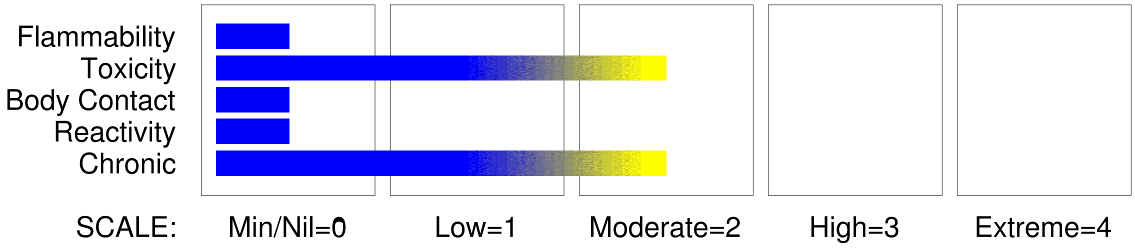
PRODUCT USE

Reagent.

SUPPLIER

Company: Bio-Chem Chemicals
5455,Nicholson Nicholson Road,
Science Market,
Ambala Cantt. 133001Haryana (India)
+91-82952 41953
info@biofinechemical.com - www.biofinechemical.com

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Respiratory Sensitizer Category 1
Skin Sensitizer Category 1

EMERGENCY OVERVIEW

HAZARD

DANGER
Determined by using GHS criteria:
H334 H317
May cause allergic or asthmatic symptoms or breathing difficulties if inhaled
May cause allergic skin reaction

PRECAUTIONARY STATEMENTS

Prevention

Avoid breathing dust/fume/gas/mist/vapours/spray.
Contaminated clothing should not be allowed out of the workplace.
In case of inadequate ventilation wear respiratory protection.

Response

IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing.
If skin irritation or rash occurs, seek medical advice/attention.
If experiencing respiratory symptoms call a POISON CENTER or doctor/physician.
Specific treatment: refer to Label or MSDS.
IF ON SKIN: Gently wash with plenty of soap and water.
Wash contaminated clothing before reuse.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
nickel(II) sulfamate	13770-89-3	>60
water		<40

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.
· If swallowed do NOT induce vomiting.
· If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
· Observe the patient carefully.
· Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
· Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
· Seek medical advice.

EYE

If this product comes in contact with the eyes:
· Wash out immediately with fresh 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.
· If pain persists or recurs seek medical attention.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear passage of breathing.
- If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

- In cases of nickel poisoning, dimercaptol delivered by deep intramuscular injection may be a suitable antidote. (Patients should not exhibit renal or hepatic dysfunction.) The use of diethyldithiocarbamate is the subject of ongoing research.
- Irritant contact dermatoses or eczemas may respond to applications of weak antiseptic packs, antibiotic ointments (tetracycline or erythromycin) or inert pastes and ointments. Systemic antibiotics are advisable in the presence of lymphangitis or lymphadenitis.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- 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.

FIRE/EXPLOSION HAZARD

Non combustible.
Not considered to be a significant fire risk.
Heating may cause expansion or decomposition leading to violent rupture of containers.
Decomposes on heating and produces toxic fumes of: nitrogen oxides (NOx) and sulfur oxides (SOx).

Personal Protective Equipment

Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Wear impervious gloves and safety glasses.
- Use dry clean up procedures and avoid generating dust.

- Sweep up or
- Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).
- Place spilled material in clean, dry, sealable, labelled container.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Control personal contact by using protective equipment and dust respirator.
- Prevent spillage from entering drains, sewers or water courses.
- Avoid generating dust.
- Sweep, shovel up. Recover product wherever possible.
- Put residues in labelled plastic bags or other containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
nickel(II) sulfamate 200 mg/m^3

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
nickel(II) sulfamate 4 mg/m^3

other than mild, transient adverse effects without perceiving a clearly defined odour is:
nickel(II) sulfamate 2.5 mg/m^3

The threshold concentration below which most people will experience no appreciable risk of health effects:
nickel(II) sulfamate 2.5 mg/m^3

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

					
+	+	+	+	+	+

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

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- 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.
- 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.

SUITABLE CONTAINER

Glass container.
Multi-ply woven plastic or paper bag with sealed plastic liner
NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.

- Check that containers are clearly labelled.

Packaging as recommended by manufacturer.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS

Keep dry.

- 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.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
nickel(II) sulfamate	10	

MATERIAL DATA

NOTE: Detector tubes for nickel, measuring in excess of 0.25 mg/m3 (as Ni) are commercially available.
Use control measures / protective gear to avoid personal contact. Animal inhalation studies in rats and guinea pigs with soluble nickel chloride of 0.1 - 1 mg nickel/m3 show a mild irritation of the lungs.
Animal inhalation studies with insoluble nickel dusts (other than nickel sulfide) at concentrations of 1 to 3 mg/m3 show no difference in respiratory cancer between exposed

and control animals.
These studies do not provide evidence that there is no excess risk of lung and nasal cancer and in view of limited exposure data and the absence of guidance for a TLV based on epidemiological studies of nickel induced respiratory tract cancer it has been necessary to incorporate the results of animal studies that have demonstrated the production of pulmonary pathology. These studies have shown consistent pulmonary damage following inhalation of 0.1 to 1 mg/m3 insoluble inorganic nickel compounds. Individuals who may be hypersusceptible or otherwise unusually responsive to industrial chemicals may not be adequately protected against adverse health effects from nickel or its compounds at concentrations below the recommended or proposed TLV.

PERSONAL PROTECTION

EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Wear chemical protective gloves, eg. PVC.
Wear safety footwear.

OTHER

- Overalls.
- Eyewash unit.

RESPIRATOR

Protection Factor	Half- Face Respirator	Full- Face Respirator	Powered Air Respirator
10 x ES	P1 Air- line*	- -	PAPR- P1 -
50 x ES	Air- line**	P2	PAPR- P2
100 x ES	-	P3	-
		Air- line*	-
100+ x ES	-	Air- line**	PAPR- P3

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult your
Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air)	0.25- 0.5 m/s (50- 100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5- 1 m/s (100- 200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1- 2.5 m/s (200- 500 f/min)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

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

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 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 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

APPEARANCE

Liquid

PHYSICAL PROPERTIES

Mixes with water.

Molecular Weight: Not available
Melting Range (℃): Not available
Solubility in water (g/L): Miscible
Boiling Range (℃): Not available
Specific Gravity (water=1): Not available
pH (as supplied): Not applicable

pH (1% solution): Not available
Volatile Component (%vol): Negligible
Relative Vapour Density (air=1): Not applicable
Lower Explosive Limit (%): Not available
Autoignition Temp (℃): Not available

Vapour Pressure (kPa): Negligible
Evaporation Rate: Not applicable
Flash Point (℃): None
Upper Explosive Limit (%): Not available
Decomposition Temp (℃): Not available

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

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

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual.
Nickel salts cause vomiting, following ingestion, as a result of astringent and irritant effects. In common with other irritant-emetics the lethal dose varies widely. Absorption is generally poor and systemic poisoning is rare. Systemic effects include increased blood sugar levels (hyperglycaemia), capillary damage (especially in the brain and adrenals), kidney damage, heart damage (myocardial weakness) and central nervous system depression.
Nickel is poorly absorbed from the gastrointestinal tract. It is transported in the plasma bound to serum albumin and various small organic ligands. Excretion in the urine is substantially complete in 4-5 days. Serum nickel is influenced by environmental nickel or nickel concentrations in the air with faecal nickel about 100 times urinary nickel. Parenterally administered nickel is rapidly distributed to kidney, pituitary, lung, skin, adrenal and ovary and testis. In vivo binding with metallothionein has been demonstrated. A nickel binding protein has also been identified in plasma; it has been tentatively identified as an alpha-1-glycoprotein with a serum alpha-1-macroglobulin complex.

EYE

Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
Solution of material in moisture on the skin, or perspiration, may increase irritant effects.
Open cuts, abraded or irritated skin should not be exposed to this material.
Nickel dusts, fumes and salts are potent contact allergens and sensitisers producing a dermatitis known as "nickel" rash.

In the absence of properly designed ventilation systems or where respiratory protective devises are inadequate, up to 10% of exposed workers are expected to be symptomatic.

INHALED

Inhalation may produce health damage*.
The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation, of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
Regular exposure to nickel fume, as the oxide, may result in "metal fume fever" a sometimes debilitating upper respiratory tract condition resembling influenza.

Symptoms include malaise, fever, weakness, nausea and may appear quickly if operations occur in closed or poorly ventilated areas. Pulmonary oedema, pulmonary fibrosis and asthma has been reported in welders using nickel alloys; level of exposure are generally not available and case reports are often confounded by mixed exposures to other agents.

Inhalation of freshly formed metal oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever". Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours following removal from exposure.

CHRONIC HEALTH EFFECTS

On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.
Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population.
Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking.
There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.
Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.
The most common toxic reaction to nickel is skin sensitisation which may produce a chronic eczema called "nickel itch". The first symptom is itching which occurs up to 7 days prior to the appearance of skin eruption. The primary skin eruption is erythematous or follicular and may be followed by superficial discrete ulcers (which discharge and become crusted), or eczema. In the chronic stages, pigmented or depigmented plaques may be formed. Recovery from the dermatitis usually occurs within 7 days but may take several weeks.

Nickel dusts and several specific compounds are carcinogenic in animals following inhalation or parenteral administration (but not by ingestion or skin contact). Increases in lung and nasal cavity cancers have been observed amongst nickel workers in smelters and refineries. Respiratory cancer risks primarily relate to chronic exposure to soluble nickels at concentrations in excess of 1 mg Ni/m3 and exposure to the less soluble forms at concentrations greater than 10 mg Ni/m3. Metallic nickel does not appear to pose such a threat.

TOXICITY AND IRRITATION

TOXICITY	IRRITATION
Intraperitoneal (mouse): LDLo: 250 mg/kg	Nil Reported

Section 12 - ECOLOGICAL INFORMATION

No data for nickel(II) sulfamate.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

REGULATIONS

nickel(II) sulfamate (CAS: 13770-89-3) is found on the following regulatory lists;
International Agency for Research on Cancer (IARC) Carcinogens