MSDS No: 0570
Material: Electroless Nickel Solution 5023A
Supplier: OM Group
Revision Date: 06.04.2004
Risk Phrases: 22, 40, 42/43, 50/53
SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

IDENTIFICATION OF THE SUBSTANCE OR PREPARATION:
PRODUCT NAME: ELECTROLESS NICKEL SOLUTION
PRODUCT CODE: 5023A

USE OF THE SUBSTANCE/PREPARATION:
Plating agent;

COMPANY IDENTIFICATION:
OMG UK LTD.
Ashton New Road
Clayton, Manchester
M11 4AT England
Telephone number: 00 44 161 230 2540 (UK: 0161 230 2540)
Telefax number: 00 44 161 230 2663 (UK: 0161 230 2663)

EMERGENCY TELEPHONE NUMBER:
Chemtrec: 1-800-424-9300 (24 hours a day, 7 days a week)

2. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Component/CAS number</th>
<th>Percent</th>
<th>EINECS-NO:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulphate 7786-81-4</td>
<td>&lt;36</td>
<td>232-104-9</td>
</tr>
</tbody>
</table>

Warning symbol, R phrases and other information:
Carc. Cat. 3; R40; Xn; R22; R42/43; N; R50-53

FURTHER INFORMATION:
Mixture (preparation)

3. HAZARDS IDENTIFICATION

Carc. Cat. 3
Limited evidence of a carcinogenic effect.
Harmful
Harmful if swallowed.
May cause sensitization by inhalation and skin contact.
Dangerous for the environment.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

4. FIRST AID MEASURES

GENERAL INFORMATION:
In case of persisting adverse effects consult a physician.

EYE CONTACT:
Separate eyelids, wash the eyes thoroughly with water (15 min). If eye irritation persists, consult a specialist.

SKIN CONTACT:
Wash off with soap and plenty of water. Remove soiled or soaked clothing immediately. Wash contaminated clothing before re-use.

INHALATION:
Remove affected person from the immediate area. Ensure supply of fresh air. Irregular breathing/no breathing: artificial respiration. Consult a physician.

INGESTION:
Rinse mouth. Consult a physician.

5. FIRE FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA:
The product itself does not burn. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment e.g.: Dry powder; Carbon dioxide (CO2); Water spray jet;

EXTINGUISHING MEDIA WHICH MUST NOT BE USED FOR SAFETY REASONS:
Strong water jet;

SPECIAL EXPOSURE HAZARDS ARISING FROM THE SUBSTANCE OR PREPARATION ITSELF, ITS COMBUSTION PRODUCTS, OR RELEASED GASES:
In the event of fire the following can be released: Sulphur oxides (SOx);

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:
Wear self-contained breathing apparatus and protective suit.

FURTHER INFORMATION:
Collect contaminated fire extinguishing water separately. Neutralise with e.g. sodium hydroxide. Do not discharge into the drains/surface waters/groundwater.
PERSONAL PRECAUTIONS:
Refer to protective measures listed in sections 7 and 8. Avoid contact with skin, eyes and clothing. Do not breathe vapours. Ensure adequate ventilation.

ENVIRONMENTAL PRECAUTIONS:
Do not discharge into the drains/surface waters/groundwater.

METHODS FOR CLEANING UP:
Soak up with inert absorbent material (e.g. sand, silica gel, universal binder, sawdust). Send in suitable containers for recovery or disposal. (Section 13)

7. HANDLING AND STORAGE

HANDLING:
Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

SAFE HANDLING ADVICE:
Avoid contact with skin and eyes. Do not breathe vapours. If workplace exposure limits are exceeded, respiratory protection approved for this particular job must be worn.

TECHNICAL MEASURES/PRECAUTIONS:
Provide good ventilation of working area (local exhaust ventilation if necessary).

STORAGE:
Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (SEVESO II directive)

TECHNICAL MEASURES/STORAGE CONDITIONS:
Always keep in containers of same material as the original one. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep containers tightly closed in a dry, cool and well-ventilated place.

INCOMPATIBLE PRODUCTS:
Acids;

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMIT(S):
Water-soluble nickel compounds (as Ni)
Maximum Exposure Limit: 0.10 mg/m³ (TWA) (UK Occupational Exposure Limits)

EXPOSURE CONTROLS:
Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

OCCUPATIONAL EXPOSURE CONTROLS:
Avoid contact with skin and eyes. Do not breathe vapours. Avoid repeated exposure. Wear suitable protective equipment. Hold eye wash fountain available. Hold emergency shower available. Remove soiled or soaked clothing immediately. Clean skin thoroughly after work. At work do not eat, drink, smoke or take drugs. Keep away from food, drink and animal feeding stuffs. Keep working
RESPIRATORY PROTECTION:
Use a respirator with filter model A2-P3 (DIN 3181).

HAND PROTECTION:
Protective gloves: Rubber;

EYE PROTECTION:
Tightly fitting safety goggles; Face-shield;

SKIN AND BODY PROTECTION:
Clothing as usual in the chemical industry.

ENVIRONMENTAL EXPOSURE CONTROLS:
The employer shall fulfill requirements of IPPC Directive.

9. PHYSICAL AND CHEMICAL PROPERTIES

GENERAL INFORMATION:
Appearance ............................................... Liquid
Colour ............................................................. Green
Odour ............................................................. Odourless

IMPORTANT HEALTH SAFETY AND ENVIRONMENTAL INFORMATION:
pH .............................................................. 3.50 - 3.70
Boiling Point/Range ........................................ No data available.
Flash point ..................................................... No data available.
Flammability (solid, gas) .................................. No data available.
Explosive properties ........................................ No data available.
Oxidizing properties ....................................... No data available.
Relative density ............................................ 1.258
Bulk density .................................................. No data available.
Vapour pressure ............................................. No data available.
Solubility
- Water solubility ............................................. Soluble.
- Fat solubility ................................................ No data available.
Partition coefficient (n-octanol/water) ............... No data available.
Viscosity ....................................................... No data available.
Vapour density ............................................... No data available.
Evaporation Rate ........................................... No data available.

OTHER INFORMATION:
Melting Point/Range ....................................... No data available.

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:
No data available.

MATERIALS TO AVOID:
Acids;

HAZARDOUS DECOMPOSITION PRODUCTS:
Sulphur oxides (SOx);

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY:
LD50/oral/rat = 275 mg/kg

CORROSIVE EFFECTS:
Irritating to eyes and skin.

SENSITIZATION:
May cause sensitization by skin contact. May produce an allergic reaction.

SUBACUTE TOXICITY:
Carc. Cat. 3

REPRODUCTIVE TOXICITY:
No data available.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
AQUATIC TOXICITY:
EC50/48h/Salmo gairdneri: 0.26 mg/l
EC50/48h/Asellus aquaticus: 435 mg/l

TOXICITY TO OTHER ORGANISMS:
No data available.

MOBILITY:
No data available.

PERSISTENCE / DEGRADABILITY:
No data available.

BIOACCUMULATIVE POTENTIAL:
No data available.

OTHER ADVERSE EFFECTS:
No data available.
13. DISPOSAL CONSIDERATIONS


**EWC WASTE CODE:** 06 03 13 - Solid salts and solutions containing heavy metals
The listed waste code numbers, according to the European Waste Catalogue (EWC), are to be understood as a recommendation (2000/532/EC).

**WASTE FROM RESIDUES/UNUSED PRODUCTS:**
Contact manufacturer. Dispose of as special waste in compliance with local and national regulations.

**CONTAMINATED PACKAGING:**
Contaminated packaging should be emptied as far as possible. Packaging that cannot be cleaned should be disposed as special waste in compliance with local and national regulations.

14. TRANSPORT INFORMATION

**LAND TRANSPORT ADR/RID:**
- Class: 9
- Classification code: M6
- Packaging group: III
- Hazard ID no.: 90
- Label: 9
- UN-No: 3082
- Technical name: Environmentally hazardous substance, liquid, n.o.s.
- Danger releasing substance: Nickel sulphate

**MARINE TRANSPORT IMDG/GGVSee:**
The product does not constitute a hazardous substance in sea transport.

**AIR TRANSPORT ICAO/IATA:**
- Class: 9
- Packaging group: III
- UN-No: 3082
- Proper shipping name: Environmentally hazardous substance, liquid, n.o.s
- Danger releasing substance: Nickel sulphate
- Label: 9

15. REGULATORY INFORMATION

**LABELLING IN ACCORDANCE WITH EC DIRECTIVES:**
Labelling according to Directive 67/548/EEC and 1999/45/EC:

**SYMBOL(S):**
Xn - Harmful
N - Dangerous for the environment
HAZARDOUS COMPONENT(S) TO BE INDICATED ON LABEL:
Nickel sulphate;

R-PHRASE(S):
R22 - Harmful if swallowed.
R40 - Limited evidence of a carcinogenic effect.
R42/43 - May cause sensitization by inhalation and skin contact.
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASE(S):
S22 - Do not breathe dust.
S36/37 - Wear suitable protective clothing and gloves.
S60 - This material and its container must be disposed of as hazardous waste.
S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

NATIONAL REGULATIONS:
Nickel and nickel compounds are subject to the UK Chemical Hazards Information and Packaging (CHIP 3).

16. OTHER INFORMATION

LIST OF RELEVANT R-PHRASES:
R22 - Harmful if swallowed.
R40 - Limited evidence of a carcinogenic effect.
R42/43 - May cause sensitization by inhalation and skin contact.
R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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