Material Safety Data Sheet

ENRICHED ABSORBANT CANSOLV® DM

WHMIS (Classification)
CLASS D-1A : Very toxic material causing immediate and serious effects
CLASS E : Corrosive material

WHMIS (Pictograms)

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
Trade Name
Enriched ABSORBANT CANSOLV® DM
Product Code
None
Supplier
Noranda Income Limited Partnership, 860 Cadieux Gérard Boulevard, Salaberry-de-Valleyfield (Quebec) Canada J6T 6L4
Manufacturer
Noranda Income Limited Partnership, 860 Cadieux Gérard Boulevard, Salaberry-de-Valleyfield (Quebec) Canada J6T 6L4
Information Contact
Viviane DeQuoy, Industrial Hygienist
Phone Number (Business hours)
(450) 373-9144 extension 2394
Phone Number (Transport Emergency)
1-877-ERP-ACID (377-2243) (Canada)
Synonym
ABSORBANT CANSOLV® DM riche (French)
DSL (Domestic Substance List)
Listed
Name / Chemical Formula
Hydroxyalkylamine salts / Mixture
Chemical Family
Amine salts
Utilization
Gas Treatment. For industrial use only.

SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS

<table>
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<th>CAS #</th>
<th>Percentage (%)</th>
<th>TLV-TWA (mg/m³)</th>
<th>ACGIH (U.S.A.) 2008</th>
<th>OSHA (U.S.A.)</th>
<th>QUÉBEC (CA)</th>
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</thead>
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<tr>
<td>Amine (Cyclic) (1)</td>
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<td>Trade secret</td>
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<td>Not available</td>
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<td>Not available</td>
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<td>Not available</td>
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<tr>
<td>Salts (Sulfite, Bisulfite) (see note 2)</td>
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<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
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<td>Water</td>
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<td>≥ 55 ≤ 70</td>
<td>Not established</td>
<td>Not established</td>
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</table>

ACGIH : American Conference of Governmental Industrial Hygienists. OSHA : Occupational Safety and Health Administration.

Note:
Cansolv Technologies Inc. filed an exemption (Trade secret) for this product on August 16, 2001 under the Hazardous Materials Information Review Act. This exemption was granted with the registry number 5183.
This material safety data sheet for the Poor ABSORBANT CANSOLV® DM contains data, guidelines for the safe handling and processing of this product based on the Cansol Technologies Inc material safety data sheet.
1- This intermediary chemical product can contain sulfate, thiosulfate, chloride, fluoride, sulfite and bisulfite salts.
2- Possibility of SO2 formation.

Amine (Cyclic 1): ORAL (LD50) : 3730 µl/kg (Rat). CUTANEOUS (LD50) : > 10 ml/kg (Rabbit).
Amine (Cyclic 2): ORAL (LD50) : 4.920 mg/kg (Rat). CUTANEOUS (LD50) : > 5 ml/kg (Rabbit).
Amine (Cyclic 3): ORAL (LD50) : 1900 mg/kg (Rat). CUTANEOUS (LD50) : 4 ml/kg (Rabbit). INHALATION (LC50, 2 h) : 5400 mg/m³ (Mouse).
†Sulfur (Dioxide): ACGIH TLV-TWA : 2 ppm; ACGIH TLV-STEL : 35 ppm. ACGIH TLV-TWA : None; TLV-STEL : 0.25 mg/m³ (INTENDED CHANGES). NIOSH REL-TWA (≤10 hours) : 5 mg/m³ (2.0 ppm); STEL : 13 mg/m³ (5.0 ppm). IDLH : 100 ppm. QUEBEC TLV-Ceiling : 13 mg/m³ (5 ppm). INHALATION acute (LoTC) : 2.2 mg/m³/30 minutes (Human). INHALATION acute (LC50) : 2520 ppm/1 hour (Rat) ; 3000 ppm/30 minutes (Mouse). (RTECS).
Consult local authorities for acceptable exposure limits.

SECTION 3. RISK IDENTIFICATION FOR HUMAN HEALTH
Routes of Entry
Inhalation of sulfur dioxide vapours (Concentrations > 5 ppm) : Excess tearing, burning sensation (Nose, throat), coughing, wheezing, shortness of breath; Dangerous (50-100 ppm) ; May be fatal (400-500 ppm), lung damage and possibility of paralysis.

Acute Effects
Inhalation : Ingestion. Eye and skin contacts.

Eye Contact (Liquid) : Irritation with discomfort or pain, twitching and excess tearing, conjunctivitis (Excessive redness, swelling), corneal chemical burn (Severe and large; Need a rapid treatment otherwise possibility of blindness). Vapours (High concentrations) : Irritation with burning sensation, twitching and excess tearing, conjunctivitis (Excessive redness).

Skin Contact : Slight irritation (Brief contact) with itching and local redness. Prolonged contact : Chemical burns, absorption of potentially dangerous quantities.
Ingestion : Possibility of moderate or strong irritation or chemical burns (Mouth, throat, esophagus, stomach) with discomfort or pain (Mouth, throat, chest, abdomen), nausea, vomiting, diarrhea, dizziness, lipothymina, drowsiness,

2008
weakness, thirst, circulatory collapse, coma. Ingestion or vomiting: Possibility of product aspiration in the lung with pulmonary lesions. Possibility of allergic reactions (Sulfite, Bisulfite): Severe or fatal for sensitive persons.

**SECTION 4. FIRST AID MEASURES**

**Eye Contact**
Immediately rinse eyes with plenty of water, while holding eyelids open for at least 15 minutes. **DO NOT** remove contact lenses. Seek immediately medical attention, preferably an ophthalmologist.

**Skin Contact**
Remove contaminated clothing. **DO NOT** use ointments before or during the flushing phase. Flush skin gently and thoroughly with running water and non-abrasive soap. Call a physician if irritation persists. Wash contaminated clothing before reusing.

**Inhalation**
Remove the person from exposure. Bring to fresh air. Difficult breathing: Give oxygen. If not breathing: perform mouth-to-mouth resuscitation. Get immediate medical attention.

**Ingestion**
**DO NOT** induce vomiting. **Conscious and alert person**: Give 2 glasses of water or milk to dilute material. **UNCONSCIOUS** person: **DO NOT** induce vomiting or give any liquid. **Immediately** obtain medical attention.

**NOTE TO PHYSICIANS**: Any known antidote. Clinical condition monitoring of the patient, symptoms control. Irritant or corrosive product (Ingestion): ulceration and inflammation of the upper digestive tract with possibility of hemorrhage and body liquid loss, oesophagus or stomach perforation (Possibility of mediastinite or péritonitis). Vomit aspiration can caused pulmonary lesions; Do not induce vomiting using mechanical means or drugs. If gastric lavage is required, use methods to avoid aspiration hazards (Ex., gastric lavage done under endotracheal intubation).

**SECTION 5. FIRE AND EXPLOSION DATA**

**Flash Point**
Closed-cup: Pensky-Martens, closed-cup ASTM D 93 Nil. Aqueous system
Open cup: Cleveland, open cup, ASTM D 92 Nil. Aqueous system

**Flammable Limits**
Not available

**Auto-Ignition Temperature**
Not available

**Products of Combustion**
Carbon oxides (Very toxic by inhalation; In sufficient concentration, risk of asphyxia), sulfur and nitrogen oxides. An acute exposure to combustion products may cause an irritation of the respiratory tract.

**Fire Hazard**
Not available

**Explosion Hazard**
Nitrogen oxides formation

**Fire Fighting (Instructions)**
**DO NOT** scatter the material with water jets to avoid splashing and propagating the fire.

**Small fire**: Dry chemical, CO₂.
**Large fire**: Water spray, foam or alcohol-resistant foam.

Firefighters must wear full protective clothing and self-contained breathing apparatus (SCBA).

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Spill**
Contain spills with sand or other absorbant. Recover with a magnetic centrifuge pump in close-circuit and absorb SO₂ in a milk of lime solution. Prevent entry into waterways, sewers. See ERG no. 154.

**Outside plant**: Call emergency number: 1 877 ERP-ACID (1 877 377-2243).
Contact emergency teams of Environment Canada and Ministère de l’Environnement et de la Faune du Québec (MEF). OTHER PROVINCES: Environment Canada and provincial authorities.
UNITED STATES: EPA and local authorities.

**Personal Protection**
Wear respiratory equipment, gloves and protective clothing. See section 8: Personal protection. Avoid contact with liquid and vapours.

**SECTION 7. HANDLING AND STORAGE**

**Handling**
**DO NOT** inhale vapours, ingest. Avoid contact with eyes, skin and clothes. Wash thoroughly after handling. **DO NOT** keep food, water or cosmetics in washed containers.

**Storage**
Cool and well ventilated area. Keep container closed. Observe best industrial practices when storing this material.

**SECTION 8. ENGINEERING CONTROLS AND PERSONAL PROTECTION**

**Engineering Controls**
General ventilation should be sufficient when store and process in closed enclosures. If operations generate fumes, use local exhaust ventilation. Practice good housekeeping procedures to keep area clean.

**Personal Protection**
Recommandation and suggested equipement to protect against exposure to this product. Choose the appropriate clothing depending of exposure and of ambiant concentrations of SO₂. Consult a specialist for more information. Gloves and protective clothing in SARANEX, BARRICADE. Before use, user should test for close-fitting. Be sure to use a NIOSH approved respirator when SO₂ concentrations can exceed occupational exposure limits. Eyes: Full face shield, close-fit (against gas) safety goggles. Other protection: Eyewash station and safety shower.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

**Physical State and Appearance**
Liquid
**Odour**
Sulfur dioxide

**Molecular Weight**
Not available
**Taste**
Not available
pH 1.8 (Solution 10 %)  
Boiling Point Not available  
(Sulfur dioxide : Possibility of formation at room temperature)  
Melting Point Not available  
Freezing Point < -25°C  
Critical Temperature Not available  
Specific Gravity 1.3 at 20°C (Water = 1)  
Vapour Pressure 79 mmHg at 20°C  
Vapour Density Not available  
% Moisture 9 % (Weight)  
% Humidity ≥ 55 ≤ 70  
Odour Threshold Not available  
Ionicity (in Water) Not available  
Solubility 100 % at 20°C (Water)  

SECTION 10. STABILITY AND REACTIVITY DATA  
Stability Yes  
Dangerous Polymerisation No  
Conditions of Instability Possibility of decomposition under intense heat (Ex. high vapour pressure or flames) : Sulfur dioxide, volatile amines, ammoniac formation.  
Incompatibilities Acids ; Oxydants ; Aldehydes ; Alkaline metal hydroxides ; Cetones ; Epoxides ; Acrylates ; Organic halogens.  
Corrosivity Yes (Depends upon the quantity of SO₂ fixed on the amine)  

SECTION 11. TOXICOLOGICAL INFORMATION  
Chronic Effects Repeated or prolonged exposure : Possibility of stenosis of the pulmonary route with 1'asthma or chronic bronchitis. Ethyleneamines (Inhalation) : Possibility of respiratory tract sensitization ; Possibility of asthmatic reaction with future exposures. Development of chronic hypersensibility reactions of the respiratory tract, asthmatic reactions or other respiratory disorders after exposure to extremely low concentrations, even under the irritation level, or to other respiratory irritants. Any formal detection method exists ; Necessary precautions should be taken to protect predisposed persons. Possibility of effects on the central nervous system (Example epilepsy) by oral route administrations (Therapeutic quantities) whose effects ceased soon after the administration is stopped.  
Amines : This product contains one or several amines that can react with nitrites and form nitrosamines (Cer tains nitrosamines are cancerogens for laboratory animals). Animals : A component has caused birth defect and toxic effects on foetuses, at toxic doses for pregnant females ; A component has caused females reproductive toxic effects.  
Sulfite and bisulfite : Allergic reactions even with small quantities, on a more or less long period of time.  
Toxicity Workers with the following pre-existing conditions warrant particular attention : Dermatitis ; Asthma and inflammatory lung diseases or fibrous pneumopathies. Eating, drinking and smoking must be prohibited in areas where this material is handled and processed. Workers must wash hands and face before eating, drinking and smoking.  

SECTION 12. ECOTOXICOLOGICAL INFORMATION  
Ecotoxicity Contact Cansolv Technologies Inc. at the number (514) 382-4411 extension 21 or 22  
Toxicity to Animals Not available  
Biodegradation Products Not available  
Biodegradation Products (Toxicity) Not available  
Remarks on Environment Prevent entry into waterways, sewers. Not rapidly biodegradable. A major spill could be toxic to fish. Prevent large spill entry into waterways, sewers. High oxygen demand and pH changes may create a toxic environment.  
BOD₅ and COD Not available  

SECTION 13. DISPOSAL ARRANGEMENTS  
Waste Disposal Incinerate in oven in full compliance with federal, provincial and municipal regulations. Empty containers should be recycled or disposed by waste management legal facility. The disposal method herein mentioned apply to the sold product. The adequate disposal of the used product should be evaluated in order to establish the appropriate waste management measures in compliance with laws and regulations in your region.  

SECTION 14. TRANSPORT INFORMATION  
TDG (Pictograms) CLASS 8 Corrosives  
PIN UN1760 CORROSIVE LIQUID N.O.S. (SULFUR DIOXIDE) P.G. II (Small and large containers)  
Special Provisions (Transport) Not applicable  

SECTION 15. OTHER REGULATIONS  
Other Regulations The amines (Cyclic 1, 2, and 3) are controlled products or on the Ingredient Disclosure List (Hazardous Products Act, sections 13 and 14, Canada).
### Classification HCS (U.S.A.)
Not applicable

### Classifications DSCL (EEC)
Not applicable

### NFPA (National Fire Protection Association) (U.S.A.)

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<tr>
<th>Fire Hazard</th>
<th>Reactivity</th>
<th>Health</th>
<th>Special Hazard</th>
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<tr>
<td>1</td>
<td>0</td>
<td>3</td>
<td>Special Hazard</td>
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### DOT (U.S.A.) (Pictograms)  DSCL (Europe) (Pictograms)  ADR (Europe) (Pictograms)

### Section 16. Other Information

#### References
- North American Emergency Response Guidebook Documents (2004), Developed by the U.S. Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico
- Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition
- Règlement sur les produits contrôlés (Canada)
- RTECS (2008). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e édition, Lauwerys

For additional health and security information on this product, contact sales or customer service representative of Cansolv Technologies Inc. at this number (514) 382-4411 extension 21 or 22 and obtain the following brochures:
- Ethyleneamines (Family products)
- Ethyleneamines Storage & Handling
- Ethyleneamines Workplace Monitoring Methods.

### Glossary
- CSST : Commission de la Santé et de la Sécurité du Travail (Québec).
- HSDB : Hazardous Substances Data Bank.
- NTP : U.S. National Toxicology Program.
- RTECS : Registry of Toxic Effects of Chemical Substances

### Note
No specific studies have been performed on this mixture. For your protection, we suggest that you test it before using in your process.

### Written by:
Groupe STEM Consultants / Noranda Income Limited Partnership

### Complete revision: 2008-06-14  Partial review: 2007-07-17

### Request
Viviane DeQuoy  Tel.: (450) 373-9144 Extension 2394  Fax: (450) 373-4827
Noranda Income Limited Partnership, 860 Gerard Cadieux Boulevard, Salaberry-de-Valleyfield (Québec) Canada J6S 4W2

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