Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

DOWEX™ MONOSPHERE™ 650C H Ion Exchange Resin

Revision Date: 07/17/2012

Supplier
THE DOW CHEMICAL COMPANY
2030 WILLARD H DOW CENTER
MIDLAND, MI 48674-0000 United States

For non-emergency information contact: 800-258-2436

Emergency telephone number 989-636-4400

Local emergency telephone number 989-636-4400

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2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strong acid cation exchange polymer, hydrogen ion form</td>
<td>39389-20-3</td>
<td>51.0 - &lt;= 55.0 %</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>45.0 - &lt;= 49.0 %</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance
Form solid Beads
Colour yellow clear

Hazard Summary
DANGER!
MATERIAL CAN CAUSE THE FOLLOWING:
CORROSION TO EYES
IRRITATING TO RESPIRATORY SYSTEM AND SKIN.

Potential Health Effects
Primary Routes of Entry: Inhalation
Skin contact
Eye contact

**Eyes:** Material can cause the following:
corrosion to eyes
reddening
tearing
May cause permanent eye injury.

**Skin:** Prolonged or repeated skin contact can cause the following:
slight irritation

**Inhalation:** Inhalation of dust can cause the following:
irritation of nose, throat, and lungs

### 4. FIRST AID MEASURES

**Inhalation:** Move to fresh air.

**Skin contact:** Wash off with soap and water. If skin irritation persists, call a physician.

**Eye contact:** Immediately flush the eye with plenty of water for at least 15 minutes, holding the eye open. Get prompt medical attention.

**Notes to physician:** Treatment should be directed at preventing absorption, administering to symptoms (if they occur), and providing supportive therapy.

### 5. FIREFIGHTING MEASURES

**Flash point**
not applicable

**Suitable extinguishing media:** Use the following extinguishing media when fighting fires involving this material:
- Water spray
- Carbon dioxide (CO2)
- Foam
- Dry chemical

**Specific hazards during firefighting:** Toxic fumes are generated when material is exposed to fire or fire conditions. Cool closed containers exposed to fire with water spray.

**Special protective equipment for firefighters:** In the event of fire, wear self-contained breathing apparatus.

**Further information:** Remain upwind.
Avoid breathing smoke.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Appropriate protective equipment must be worn when handling a spill of this material. See SECTION 8, Exposure Controls/Personal Protection, for recommendations. If exposed to material during clean-up operations, see SECTION 4, First Aid Measures, for actions to follow.

Environmental precautions
WARNING: KEEP SPILLS OF PRODUCT AS SUPPLIED OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER. DO NOT DISCHARGE CLEANING RUNOFFS DIRECTLY TO OPEN BODIES OF WATER. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods for cleaning up
Keep spectators away. Floor may be slippery; use care to avoid falling. Transfer spilled material to suitable containers for recovery or disposal.

7. HANDLING AND STORAGE

Handling
Avoid repeated freeze-thaw cycles; beads may fracture. If frozen, thaw at room temperature. Avoid contact with skin, eyes and clothing. Corrosive to eyes. See SECTION 8, Exposure Controls/Personal Protection, prior to handling.

Storage
Further information on storage conditions: Keep from freezing. Keep in a dry, cool place. Keep container tightly closed. Further information: CAUTION: Do not pack column with dry ion exchange resins. Dry beads expand when wetted; this expansion can cause glass column to shatter.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit(s)
Exposure limits are listed below, if they exist.

Exposure controls
Engineering measures: None required under normal operating conditions.

Protective measures: Facilities storing or utilizing this material should be equipped with an eyewash facility.

Individual protection measures

Eye/face protection: Chemical resistant goggles must be worn. Eye protection worn must be compatible with respiratory protection system employed.
Skin protection

Hand protection: Cotton or canvas gloves.

Respiratory protection: No personal respiratory protective equipment normally required.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>solid Beads</td>
</tr>
<tr>
<td>Form</td>
<td>solid Beads</td>
</tr>
<tr>
<td>Colour</td>
<td>yellow clear</td>
</tr>
<tr>
<td>pH</td>
<td>&gt;3.5</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>0 °C (32 °F) Water</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>100 °C (212.00 °F) Water</td>
</tr>
<tr>
<td>Flash point</td>
<td>not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>17.0 mmHg</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>insoluble</td>
</tr>
</tbody>
</table>

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions Stable under normal conditions.

Materials to avoid Avoid contact with the following: Strong Oxidizers

Hazardous decomposition products Thermal decomposition may yield the following: monomer vapors, polymerisation

Product will not undergo polymerization.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

No data are available for this material. The information shown is based on profiles of compositionally similar materials.

Component: Strong acid cation exchange polymer, hydrogen ion form

Acute oral toxicity LD50 rat >2,000 mg/kg

Component: Strong acid cation exchange polymer, hydrogen ion form
Acute inhalation toxicity
LC50 rat 4 Hour 11 mg/l

Component: Strong acid cation exchange polymer, hydrogen ion form

Skin irritation
rabbit OECD Test Guideline 404 4 Hour non-irritating

Component: Strong acid cation exchange polymer, hydrogen ion form

Eye irritation
rabbit OECD Test Guideline 405 24 Hour Corrosive

Component: Strong acid cation exchange polymer, hydrogen ion form

Mutagenicity
Reverse mutation test using bacteria: Non-mutagenic with and without metabolic activation

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

13. DISPOSAL CONSIDERATIONS

Environmental precautions: WARNING: KEEP SPILLS OF PRODUCT AS SUPPLIED OUT OF MUNICIPAL SEWERS AND OPEN BODIES OF WATER. DO NOT DISCHARGE CLEANING RUNOFFS DIRECTLY TO OPEN BODIES OF WATER.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Disposal
Waste Classification: When a decision is made to discard this material as supplied, it does not meet RCRA’s characteristic definition of ignitability, corrosivity, or reactivity, and is not listed in 40 CFR 261.33. The toxicity characteristic (TC), however, has not been evaluated by the Toxicity Characteristic Leaching Procedure (TCLP). Unused material may be incinerated or landfilled in facilities meeting local, state, and federal regulations. (See 40 CFR 268)

Contaminated packaging: Empty containers should be taken to local recyclers for disposal. Refer to applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

DOT
Not regulated for transport

Classification for SEA transport (IMO-IMDG):
Not regulated for transport

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.
15. REGULATORY INFORMATION

Workplace Classification
OSHA: This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

WHMIS: This product is a 'controlled product' under the Canadian Workplace Hazardous Materials Information System (WHMIS).

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Acute Health Hazard

SARA TITLE III: Section 313 Information (40CFR372)
This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

CERCLA Information (40CFR302.4)
Releases of this material to air, land, or water are not reportable to the National Response Center under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or to state and local emergency planning committees under the Superfund Amendments and Reauthorization Act (SARA) Title III Section 304.

United States TSCA Inventory (US.TSCA): All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

Pennsylvania
Any material listed as "Not Hazardous" in the CAS REG NO. column of SECTION 2, Composition/Information On Ingredients, of this MSDS is a trade secret under the provisions of the Pennsylvania Worker and Community Right-to-Know Act.

16. OTHER INFORMATION

HMIS Hazard Rating

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
<th>Physical Hazard</th>
<th>PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend
ACGIH American Conference of Governmental Industrial Hygienists
BAc Butyl acetate
OSHA Occupational Safety and Health Administration
PEL Permissible Exposure Limit
STEL Short Term Exposure Limit (STEL):
TLV Threshold Limit Value
TWA Time Weighted Average (TWA):
| Bar denotes a revision from prior MSDS. |
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Version: 1.0
Print Date: 10/02/2014