Material Safety Data Sheet
Avicel® RC-581 Microcrystalline Cellulose and Sodium Carboxymethylcellulose

MSDS #: RC581-NFDR080I-B
Revision Date: 2014-03-24
Version 1

This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200 And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Avicel® RC-581 Microcrystalline Cellulose and Sodium Carboxymethylcellulose
Synonyms: Microcrystalline cellulose (INCI Name): MCC, cellulose gel; Sodium Carboxymethylcellulose: NaCMC, CMC, SCMC, Carboxymethyl ether, Sodium CMC, Sodium salt, Cellulose gum

Recommended use: Pharmaceutical.

Manufacturer: FMC Corporation
1735 Market Street
Philadelphia, PA 19103
(800) 526-3649
msdsinfo@fmc.com

Emergency telephone number
1 302 / 451-0100 (FMC Plant - Newark, Delaware)
(303) 595-9048 (Medical - U.S. - Call Collect)
For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

Emergency Overview

Dry or powdered ingredients are combustible. Dispersal of finely divided dust from products into air may form mixtures that are ignitable and explosive. Minimize airborne dust generation and eliminate sources of ignition. May cause skin irritation and/or dermatitis.

Appearance: free flowing powder
Physical state: free flowing powder
Odor: Odorless

Eyes: May cause slight irritation.
Skin: May cause irritation.
Inhalation: Inhalation of dust in high concentration may cause irritation of respiratory system.
Ingestion: Ingestion may cause gastrointestinal discomfort including nausea, vomiting and diarrhea if large amounts are ingested. Potential for aspiration if swallowed.

Aggravated Medical Conditions: Respiratory disorders.
3. COMPOSITION/INFORMATION ON INGREDIENTS

Non-Hazardous

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>9004-34-6</td>
</tr>
<tr>
<td>Sodium carboxymethylcellulose</td>
<td>9004-32-4</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention immediately if symptoms occur.

Skin contact
Wash with water and soap as a precaution.

Inhalation
Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Consult a physician.

Ingestion
Never give anything by mouth to an unconscious person. Drink plenty of water. Get medical attention immediately if symptoms occur.

Indication of immediate medical attention and special treatment needed, if necessary
Treat symptomatically.

Protection of first-aiders
Use personal protective equipment.

5. FIRE-FIGHTING MEASURES

Flash Point
Not applicable

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific hazards arising from the chemical
Avoid dust formation. Dusts or fumes may form explosive mixtures in air.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA
- Health Hazard: 0
- Flammability: 1
- Stability: 0
- Special Hazards: -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear personal protective equipment. Avoid contact with the skin and the eyes. Avoid dust formation. For personal protection see section 8.

Methods for containment
Maintain good housekeeping practices to avoid accumulation of settled dust, especially on overhead surfaces

Methods for cleaning up
Sweep or vacuum up spillage and return to container. Washdown water is not recommended.
7. HANDLING AND STORAGE

Handling

Avoid dust formation. Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Refer to Section 8.

Storage

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 15 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>Mexico: TWA 10 mg/m³</td>
</tr>
<tr>
<td>9004-34-6</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>Mexico: STEL 20 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>British Columbia</th>
<th>Quebec</th>
<th>Ontario TWAEV</th>
<th>Alberta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>TWA: 10 mg/m³</td>
</tr>
<tr>
<td>9004-34-6</td>
<td>TWA: 3 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 5 mg/m³</td>
</tr>
</tbody>
</table>

Occupational exposure controls

Engineering measures

Apply technical measures to comply with the occupational exposure limits.

Personal Protective Equipment

General Information

If the product is used in mixtures, it is recommended that you contact the appropriate protective equipment suppliers. These recommendations apply to the product as supplied.

Respiratory protection

In case of insufficient ventilation wear suitable respiratory equipment.

Eye/face protection

Safety glasses.

Skin and body protection

No special precautions required.

Hand protection

No special precautions required. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion and the contact time. If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves.

Hygiene measures

When using, do not eat, drink or smoke. Wear suitable gloves and eye/face protection. Wash hands before breaks and at the end of workday.
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>free flowing powder</td>
</tr>
<tr>
<td>Color</td>
<td>off-white</td>
</tr>
<tr>
<td>Physical state</td>
<td>free flowing powder</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>(In solution) 6.0 - 8.0 (2% solids dispersion)</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>not determined</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No information available.</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>No information available.</td>
</tr>
<tr>
<td>Bulk density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Water solubility</td>
<td>No information available.</td>
</tr>
<tr>
<td>Percent volatile</td>
<td>No information available.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No information available.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability: Stable.

Conditions to avoid: Excessive heat. Dust formation.

Hazardous decomposition products: None under normal use.

Hazardous polymerization: Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity: This product is expected to have low oral, dermal and inhalation toxicity.

- Skin contact: Non-irritating (Rabbit). (Primary Irritation Index (PII)= 0.8).
- Eye contact: Non-irritating (Rabbit).
- Inhalation: May cause irritation of respiratory tract.
- Ingestion: May cause gastrointestinal discomfort if consumed in large amounts. Potential for aspiration if swallowed.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral (mg/kg)</th>
<th>LD50 Dermal (g/kg)</th>
<th>LC50 Inhalation (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td>&gt;5000 Rat</td>
<td>&gt;2 Rabbit</td>
<td>&gt;5800 Rat 4h</td>
</tr>
<tr>
<td>Sodium carboxymethylcellulose</td>
<td>&gt;5000 Rat</td>
<td>&gt;2 Rabbit</td>
<td>&gt;5800 Rat 4h</td>
</tr>
</tbody>
</table>

Chronic Toxicity: No known effect based on information supplied.

Carcinogenicity: Contains no ingredient listed as a carcinogen.

Sensitization: Not expected to be sensitizing based on the components.
Avicel® RC-581 Microcrystalline Cellulose and Sodium Carboxymethylcellulose

Developmental Toxicity: No information available.
Teratogenicity: No information available.
Target Organ Effects: Respiratory system.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

Ecotoxicity effects: The environmental impact of this product has not been fully investigated.

<table>
<thead>
<tr>
<th>Active Ingredient(s)</th>
<th>Duration</th>
<th>Species</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose (9004-34-6)</td>
<td>48 h LC50</td>
<td>Daphnia</td>
<td>&gt; 100%</td>
<td>saturated solution</td>
</tr>
<tr>
<td>Microcrystalline cellulose</td>
<td>96 h LC50</td>
<td>Rainbow trout</td>
<td>&gt; 100%</td>
<td>saturated solution</td>
</tr>
<tr>
<td>Microcrystalline cellulose</td>
<td>96 h EC50</td>
<td>Algae</td>
<td>&gt; 100%</td>
<td>saturated solution</td>
</tr>
</tbody>
</table>

Environmental Fate

Persistence and degradability: No product level data available. Microcrystalline cellulose is inherently biodegradable in soil. Microcrystalline cellulose biodegrades in soil at a rate comparable to corn starch.

Bioaccumulation: Bioaccumulation is unlikely.

Mobility: No information available.

Other adverse effects: None known

**13. DISPOSAL CONSIDERATIONS**

Waste disposal methods: This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated packaging: Dispose of in accordance with local regulations.

**14. TRANSPORT INFORMATION**

**DOT** not regulated

**TDG** not regulated

**ICAO/IATA** not regulated

**IMDG/IMO** not regulated

**15. REGULATORY INFORMATION**

International Inventories
Avicel® RC-581 Microcrystalline Cellulose and Sodium Carboxymethylcellulose

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TSCA Inventory (United States of America)</th>
<th>DSL (Canada)</th>
<th>EINECS/E LINCS (Europe)</th>
<th>ENCS (Japan)</th>
<th>IECSC (China)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose 9004-34-6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Sodium carboxymethylcellulose 9004-32-4</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend: X - Listed

U.S. Federal Regulations
SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
- **Acute Health Hazard**: no
- **Chronic Health Hazard**: no
- **Fire Hazard**: no
- **Sudden Release of Pressure Hazard**: no
- **Reactive Hazard**: no

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

International Regulations
Mexico - Grade
Minimum risk, Grade 0

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcrystalline cellulose</td>
<td></td>
<td>Mexico: TWA 10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mexico: STEL 20 mg/m³</td>
</tr>
</tbody>
</table>

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
Non-controlled
### 16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazard</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

**NFPA/HMIS Ratings Legend**
Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

**Revision Date:** 2014-03-24  
**Reason for revision:** No information available.

**Disclaimer**
FMC Corporation believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specified product designated and may not be applicable where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of FMC Corporation, FMC corporation expressly disclaims any and all liability as to any results obtained or arising from any use of the products or reliance on such information.

**Prepared By**
RC591 and FMC Logo - Trademarks of FMC Corporation

© 2014 FMC Corporation. All Rights Reserved.

End of Material Safety Data Sheet