MATERIAL SAFETY DATA SHEET

1. Chemical product and company identification

A. Product name **CARULITE® 200 CATALYST**

B. Recommended use and Limitations on use

Recommended use Air purification media for the destruction of ozone and odors.

Limitations on use Use in accordance with supplier's recommendations.

Manufacturer/Importer/Distributor information

Manufacturer/Supplier

Company name CARUS CORPORATION

Address 315 Fifth Street,
Peru, IL 61354, USA

Telephone +1 815 223-1500 - All other non-emergency inquiries about the product should be directed to the company

E-mail salesmkt@caruscorporation.com

Website www.caruscorporation.com

Contact person Shelley Corban

Emergency telephone number For Hazardous Materials [or Dangerous Goods] Incidents ONLY
(spill, leak, fire, exposure or accident), call CHEMTREC at
CHEMTREC®, Korea (toll free): 00-308-13-2549
CHEMTREC®, Other countries: 001 (703) 527-3887

MSDS number -

2. Hazards identification

A. Hazard category/Classification

Physical hazards	Not classified.	
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, inhalation	Category 4
	Specific target organ toxicity, repeated exposure	Category 2 (Brain)
Environmental hazards	Not classified.	

B. Warning label items including precautionary statement

• Pictogram

• Signal word Warning

• Hazard statement

H302	Harmful if swallowed.
H332	Harmful if inhaled.
H373	May cause damage to organs (Brain) through prolonged or repeated exposure.

• Precautionary statement

Prevention

P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.

Response

P330	Rinse mouth.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

P405	Store locked up.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

C. Other hazards not included in the hazard category criteria (e.g. dust explosion hazard)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Chemical identity	Common and alternative names	CAS number	ID number	Content in percent (%)
Manganese dioxide		1313-13-9	KE-23017	40 - 70
Copper oxide		1317-38-0	KE-08942	15 - 40

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First aid measures

A. In case of eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops or persists.
B. In case of skin contact	Wash off with soap and water. Wash contaminated clothing before reuse. If skin irritation occurs: Get medical advice/attention.
C. In case of inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
D. In case of swallowing	Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.
E. Note to physician	Provide general supportive measures and treat symptomatically.
Most important symptoms/effects, acute and delayed	Dusts may irritate the respiratory tract, skin and eyes. Prolonged exposure may cause chronic effects.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

A. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials.
Unsuitable extinguishing media	None.

B. Specific hazards arising from the chemical (example: hazardous combustion products)	During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Carbon oxides (COx). Metal oxides.

C. Specific methods of fire-fighting

Special protective equipment for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus. Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace.
Special fire fighting procedures	Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out.
General fire hazards	Not itself combustible but assists fire in burning materials.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained. Avoid breathing dust.
B. Environmental precautions	Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.
C. Methods and materials for containment and cleaning up	Stop the flow of material, if this is without risk. Dike far ahead of spill for later disposal. Following product recovery, flush area with water. For waste disposal, see section 13 of the MSDS.

7. Handling and storage

A. Precautions for safe handling	Provide adequate ventilation. Avoid inhalation of dust and contact with skin and eyes. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Handle and open container with care. Do not taste or swallow. Do not eat, drink or smoke when using the product. Observe good industrial hygiene practices.

B. Conditions for safe storage (including any incompatibilities) Store locked up. Store in original tightly closed container. Store in a cool, dry place out of direct sunlight. Keep out of reach of children. Use care in handling/storage. Store away from incompatible materials (See Section 10).

8. Exposure controls/personal protection

A. Exposure limit values, biological limit values, etc

Korea. OELs. Standards for Exposure to Chemical Substances and Physically Hazardous Factors

Components	Type	Value
Manganese dioxide (CAS 1313-13-9)	TWA	1 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Copper oxide (CAS 1317-38-0)	TWA	1 mg/m3	Dust and mist.
		0.2 mg/m3	Fume.
Manganese dioxide (CAS 1313-13-9)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.

Biological limit values No biological exposure limits noted for the ingredient(s).

B. Appropriate engineering controls Ventilate as needed to control airborne dust. Provide adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust. Eye wash facilities and emergency shower must be available when handling this product.

C. Personal protective equipment

- **Respiratory protection** In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. Seek advice from local supervisor.
- **Eye protection** Wear dust-resistant safety goggles where there is danger of eye contact.
- **Hand protection** Wear protective gloves. Suitable gloves can be recommended by the glove supplier.
- **Body protection** Wear suitable protective clothing.

Hygiene measures Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

A. Appearance

Physical state	Solid.
Form	Granular.
Color	Brown or black.

B. Odor None.

C. Odor threshold Not applicable.

D. pH Not applicable.

E. Melting point/freezing point Not available.

F. Boiling point, initial boiling point, and boiling range Not applicable.

G. Flash point Not applicable.

H. Evaporation rate Not applicable.

I. Flammability (solid, gas) Non flammable.

J. Upper/lower limit on flammability or explosive limits

Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.

K. Vapor pressure Not applicable.

L. Solubility

Solubility (water) Insoluble in water.

M. Vapor density Not applicable.

N. Specific gravity Not available.

O. n-octanol/water partition coefficient	Not applicable.
P. Auto-ignition temperature	Not applicable.
Q. Decomposition temperature	1299.2 °F (704 °C)
R. Viscosity	Not applicable.
S. Molecular weight	Not available.

Other data

Bulk density	800 - 900 kg/m3

10. Stability and reactivity

Reactivity The product is stable and non-reactive under normal conditions of use, storage and transport.

A. Stability and hazardous reaction potential

Stability	Stable under normal temperature conditions.
Hazardous reaction potential	Hazardous polymerization does not occur.
B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)	Avoid incompatible materials and intense heat.
C. Incompatible materials	Oxidizing material. Combustible material. Reducing agents. Aluminum. Strong acids.
D. Hazardous decomposition products	Copper fumes.

11. Toxicological information

A. Information on likely routes of exposure

• Respiratory organs	Harmful if inhaled. Dust may irritate respiratory system or lungs.
• Skin	Dust/mist may irritate skin.
• Eyes	Dust in the eyes may cause irritation.
• Mouth	Harmful if swallowed.

B. Information on health hazards

• Acute toxicity (list all possible routes of exposure) Harmful if inhaled or swallowed.

Components	Species	Test Results
Copper oxide (CAS 1317-38-0)		
Acute		
Dermal		
LD50	Rat	> 2000 mg/kg, 24 Hours (OECD Test Guideline 402)
Oral		
LD50	Rat	> 2500 mg/kg (OECD Test Guideline 423)

• Corrosivity or irritation to the skin Dust may cause skin irritation.

Manganese dioxide (CAS 1313-13-9)	OECD 404, EU Method B.4 Result: Not irritating. Species: Rabbit
Copper oxide (CAS 1317-38-0)	OECD Test Guideline 404 Result: Not irritating. Species: Rabbit

• Serious eye damage/eye irritation Dust may cause eye irritation.

Eye

Manganese dioxide (CAS 1313-13-9)	OECD 405, EU Method B.5 Result: Not irritating. Species: Rabbit
Copper oxide (CAS 1317-38-0)	OECD Test Guideline 405 Result: Not irritating. Species: Rabbit

• Respiratory sensitization	Not classified.
• Skin sensitization	Not classified.

Skin sensitization

Copper oxide (CAS 1317-38-0)	OECD Test Guideline 406 Result: Not sensitizing. Species: Guinea pig

• Carcinogenic properties /Carcinogenicity	Not classified.
• Mutagenic properties /Mutagenicity	Not available.
• Reproductive toxicity	Not classified.
• Specific target organ toxicity - single exposure	Not classified.
• Specific target organ toxicity - repeated exposure	May cause damage to the following organs through prolonged or repeated exposure: Brain.
• Aspiration hazard	Not classified.

12. Ecological information

A. Ecotoxicity The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
Manganese dioxide (CAS 1313-13-9)			
Other			
Other	EC50	Activated sewage sludge	> 1000 mg/l, 3 hr
	NOEC	Activated sewage sludge	1000 mg/l

B. Persistence/degradability	No data available.
C. Bioaccumulative potential	No data available.
D. Mobility in soil	The product is insoluble in water.
E. Other adverse effects	None known.

13. Disposal considerations

A. Method of disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
B. Disposal considerations (including disposal of contaminated containers or packaging)	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
Waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

14. Transport information

KRDG

A. UN number	Not applicable.
B. UN proper shipping name	Not applicable.
C. Transport hazard class(es)	
Class	Not applicable.
Subsidiary risk	-
D. Packing group	Not applicable.
E. Environmental hazards	No.
F. Special precautions for user	
Special precautions	Not applicable.

IATA

A. UN number	Not applicable.
B. UN proper shipping name	Not applicable.
C. Transport hazard class(es)	
Class	Not applicable.
Subsidiary risk	-
D. Packing group	Not applicable.
E. Environmental hazards	No.
F. Special precautions for user	Not applicable.

IMDG

A. UN number	Not applicable.

B. UN proper shipping name	Not applicable.
C. Transport hazard class(es)	
Class	Not applicable.
Subsidiary risk	-
D. Packing group	Not applicable.
E. Environmental hazards	
Marine pollutant	No.
EmS	Not applicable.
F. Special precautions for user	Not applicable.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	This product is not intended to be transported in bulk.

15. Regulatory information

A. Restrictions under the Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacturing

Not regulated.

Harmful Substances Requiring Permission for Manufacture or Use

Not regulated.

Controlled Hazardous Substances

Copper oxide (CAS 1317-38-0)
Manganese dioxide (CAS 1313-13-9)

Harmful Substances Requiring Special Medical Examination

Manganese dioxide (CAS 1313-13-9)

Workplace Environmental Monitoring Harmful Materials

Manganese dioxide (CAS 1313-13-9)

Occupational Exposure Limit

Manganese dioxide (CAS 1313-13-9)

B. Restrictions under the Chemicals Control Law (Previously Toxic Chemicals Control Law)

Accidental Release Prevention Substances

Not regulated.

Act on the Registration and Evaluation of Chemicals

Banned Toxic Chemicals

Not regulated.

Designated Existing Chemicals Subject to Registration (PEC) (MoE No. 2015-92)

Copper oxide (CAS 1317-38-0)

Restricted Chemical Substances

Not regulated.

Toxic Chemicals

Not regulated.

C. Restrictions under the Dangerous Substance Safety Management Act

Not dangerous goods under the Dangerous Substance Safety Management Law

D. Restrictions under the Wastes Control Act

Halogenated Materials in Waste Organic Solvents

Not regulated.

Hazardous Substances

Copper oxide (CAS 1317-38-0)	Hazardous substances in slag, dust, waste molding sand & sand from sand blast, waste refractories & ceramic pieces, residues of incineration, materials treated for stabilization, & waste catalysts 3 MG/L Hazardous substances in sludge, waste absorbers and absorbers 3 MG/L

E. Restrictions under other foreign or domestic laws

Clean Air Conservation Act

Air Pollutants

Copper oxide (CAS 1317-38-0)
Manganese dioxide (CAS 1313-13-9)

Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides (Rules on PIC, MoE No. 2014-252, Dec. 31, 2014; Standards for Pesticides, RDA No. 2014-26), as amended

Not listed.

Specific Air Pollutants

Not regulated.

Further information This material safety data sheet was prepared in accordance with Article 41 of the Industrial Safety and Health Law.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

A. Source of information

HSDB® - Hazardous Substances Data Bank
Korea. Accidental Release Prevention Substances (Presidential Decree of Toxic Chemical Control Law, Executive Order No. 19203)
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)
Korea. Non-Toxic Chemicals List (National Institute of Environment Research (NIER) Public Notice No. 1997-10, as amended)
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)
Korea. Prohibited Chemical Substances (TCCL Article 11)
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)
Korea. Toxic Chemical Control Law (TCCL), Existing Chemicals Inventory (KECI)
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List
Korea. Toxic Chemicals (TCCL Article 10)
Korea. Toxic Release Inventory (TRI) Chemicals (TCCL Article 14)
Registry of Toxic Effects of Chemical Substances (RTECS)

B. Issue date 02-July-2019

C. Number of revisions and date of most recent revision 02-July-2019 (01 revision)

D. Other Not available.

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