

MULTIHANCE MATERIAL SAFETY DATA SHEET

The author of this Material Safety Data Sheet (MSDS) is Bracco Diagnostics Inc. Please carefully review all of the information disclosed in this MSDS prior to handling or using the product referenced below.

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Bracco Diagnostics Inc.
P.O. Box 5225
Princeton, NJ 08543

Product Identification: MultiHance.

1. Chemical Name: (4RS)-[4-carboxy-5,8,11-tris(carboxymethyl)-1-phenyl-2-oxa-5,8,11-triazatridecan-13-oato(5-)] gadolinate(2-) dihydrogen compound with 1-deoxy-1-(methylamino)-D-glucitol (1:2).
2. Synonyms: Gadobenate dimeglumine injection.
3. How Supplied: Each single/multi dose glass vial is elastomeric stoppered (latex free) with an aluminum seal. MultiHance is supplied in boxes of five with different fill volumes (5, 10, 15, 20, 50 or 100 mL) and vial sizes.
4. Product Use: Indicated for intravenous use as an adjunct to MRI in Central Nervous System imaging.
5. Chemical Family: Paramagnetic agent.
6. Molecular Formula (gadobenate dimeglumine): C₂₂H₂₈GdN₃O₁₁ 2(C₇H₁₇NO₅).
7. CAS NUMBER (gadobenate dimeglumine): 127000-20-8

EMERGENCY CONTACTS: (Health) 1-800-257-5181.
(U.S. Transportation) Chemtrec 1-800-424-9300.
(International Transportation) Chemtrec 1-703-527-3887.

EMERGENCY OVERVIEW: MultiHance is a clear, colorless solution. See Health Effects and Toxicology sections for additional information.

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENTS (>1%)	HAZARDOUS (Y/N)	CONCENTRATION (w/w%)	CAS NUMBER	EXPOSURE GUIDELINE
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Gadobenate dimeglumine	N	52.9	127000-20-8	None
Water, USP	N	Not Applicable	7732-18-5	None

Components present at <1% or used for pH adjustment: None.

SECTION 3: HEALTH HAZARDS IDENTIFICATION

Effects of Overexposure

Routes of Entry:

1. Inhalation: Under normal conditions, this material is handled in closed vials and exposure by inhalation is not expected to occur. However, in a situation where the liquid would be aerosolized, there may be potential for inhalation. The extent of systemic absorption of the material after inhalation is not known.
2. Skin Contact: Exposure may occur via skin contact if gloves and protective clothing are not worn. The extent of systemic absorption of the material after skin contact is not known.
3. Ingestion: Ingestion of large quantities of this material in an occupational setting would not be expected to occur. Ingestion of trace amounts of the material might occur if the material contacts hands and hands are not washed prior to eating, drinking or smoking. The extent of systemic absorption of the material after ingestion is not known.

Acute

1. Ingestion: Inadvertent ingestion of trace amounts of this material would not be expected to result in symptoms.
2. Inhalation: Inhaling small doses of aerosolized material would not be expected to result in symptoms.
3. Skin Contact:
 - a. Toxic: Contact with small quantities of material for short periods is not expected to result in pharmacologic or toxic effects.
 - b. Irritation: Material contains low concentrations of components that are mild irritants or possible irritants. It may have potential to cause mild irritation. However, moderate or severe irritation is not expected.
 - c. Sensitization: This material may act as a sensitizer (allergen) for those persons who are allergic to gadolinium or components in the formulation.
 - d. Eye Contact: Material contains low concentrations of components that are mild irritants or possible irritants. It may have potential to cause mild irritation, however moderate or severe irritation is not expected.
4. Eye Contact: May cause irritation.

Chronic

Repeated and prolonged exposure to skin may cause skin irritation. MultiHance is not intended for chronic use and there is no information on the possible adverse effects associated with chronic exposure.

Exposure Guideline Summary: An exposure guideline has not been established for this material.

Carcinogen Lists for gadobenate dimeglumine: IARC: No. NTP: No. OSHA: No.
Target organs for gadobenate dimeglumine: None known.

Medical Condition Aggravated by Exposure: MULTIHANCE is contraindicated in patients with known allergic or hypersensitivity reactions to gadolinium or any other ingredients including Benzyl Alcohol. MULTIHANCE may possibly potentiate sickle erythrocyte alignment in patients with sickle cell anemia.

SECTION 4: FIRST AID MEASURES

1. Ingestion: Get medical attention immediately. Vomiting may be induced if a person is conscious and if ingestion has occurred within the past three hours. Never induce vomiting in a person who is unconscious or experiencing convulsions.
 2. Inhalation: Transfer exposed person to fresh air. If person is not breathing, give artificial respiration. If breathing is difficult, administer oxygen. Get medical attention immediately.
 3. Skin Contact: Remove contaminated clothing. Wash skin with plenty of water for 5 minutes. Seek medical attention if irritation (redness, itching or swelling) develops or persists.
 4. Eye Contact: Hold eyelids apart and flush with plenty of water for 5 minutes. Get medical attention if signs of irritation develop.
 5. Note to physicians: None.
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SECTION 5: FIRE FIGHTING MEASURES

1. Flash Point: Not available.
 2. Auto-ignition Temperature: Not available.
 3. Flammability Limits:
 - a. LEL: Not available.
 - b. UEL: Not available.
 4. Combustibility of Dusts: Not available.
 5. Extinguishing Media: In case of fire, flood with water.
 6. Fire-fighting Instructions: Firefighters should wear self-contained breathing apparatus, flame and chemical resistant clothing, boots and gloves. Evacuate personnel to an upwind direction, remove unneeded material and cool container(s) with water from a maximum distance.
 7. Hazardous Combustion Products: carbon monoxide, carbon dioxide, nitrogen oxides and gadolinium oxide.
 8. Unusual Hazards: None known.
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SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill/Clean-up: Lab coat, impermeable gloves (latex, latex/nitrile or nitrile) and eye protection should be worn as a minimum precaution. Absorb spill with inert material, e.g. sand, vermiculite or other non-combustible absorbent materials, and place into a closed container for reclamation or disposal. The spill area should be ventilated and decontaminated after material is collected.

SECTION 7: HANDLING AND STORAGE

1. Handling Precautions: Avoid skin and eye contact.
2. Container Requirements: Single dose glass vial is elastomeric stoppered (latex free) with an aluminum seal. MultiHance is supplied in boxes of five with different volumes (5, 10, 15, 20, 50 or 100 mLs) and vial sizes.
3. Storage Conditions: Store at 15-30 degrees C (59 to 86 degrees F). Do not freeze.

SECTION 8: EXPOSURE CONTROLS & PERSONAL PROTECTION

1. Ventilation Requirements: None beyond good room ventilation.
2. Respiratory Protection: Not anticipated for normal clinical environment. Non-routine exposure conditions may require NIOSH approved respiratory protection. Self-contained breathing apparatus should be available for emergency use.
3. Eye Protection: Wear safety glasses (ANSI Z87.1).
4. Protective Gloves: Wear impervious gloves (latex, latex/nitrile, or nitrile) if the potential exists for dermal contact.
5. Special Clothing: None.
6. Hygiene: Wash hands after handling product and before eating, smoking, using lavatory and at the end of the day.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

For MultiHance unless indicated otherwise.

1. Appearance/Physical State/Color: Clear, colorless, aqueous liquid.
2. Boiling Point: Not available.
3. Evaporation Rate: Not available.
4. Flash Point: Not available.
5. Freezing point/Melting Point: Not available.
6. Octanol/Water Partition Coefficient: Not available.
7. Odor: Not remarkable
8. pH (of solution): 6.5 to 7.5.
9. Solubility in Water: Gadobenate dimeglumine is freely soluble in water.
10. Specific Gravity: 1.220 at 20 degrees C.
11. Vapor Density: Greater than 1.0 (Air has a vapor density of 1.0.).
12. Vapor Pressure: Not available.
13. Viscosity: 9.2 mPas at 20 degrees C and 5.3 mPas at 37 degrees C.

SECTION 10: STABILITY AND REACTIVITY

1. Stability: Stable under normal conditions.
2. Incompatibilities: None known.
3. Conditions of Reactivity: None known.
4. Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, nitrogen oxides and gadolinium oxide.
5. Hazardous Polymerization: Will not occur.
6. Explosion data relative to mechanical impact: No information.
7. Explosion data relative to static discharge: No information.

SECTION 11: TOXICOLOGICAL INFORMATION –for active ingredient (gadobenate dimeglumine) unless indicated.

1. RTECS # (U.S.): Not available.
2. Acute toxicity data (for 0.5 M gadobenate dimeglumine solution):
 - a. Acute iv LD50 (rat) = 9.7 g/kg (9.2 mmol/kg)
 - b. Acute iv LD50 (mouse) = 8.3 g/kg (7.9 mmol/kg)
 - c. Acute oral LD50 (rat) > 15.8 g/kg (15 mmol/kg)
 - d. Acute oral LD50 (mouse) > 26.4 g/kg (25 mmol/kg)
3. Chronic: No harmful effects are expected from MultiHance under normal use conditions.
 - a. Carcinogenicity: No information.
 - b. Mutagenicity: A number of in vitro studies including the Ames test and in vivo mutagenicity studies including the rat micronucleus study did not show mutagenicity for MultiHance.
 - c. Teratogenicity: No teratogenic events were evident on intravenous administration of MultiHance to pregnant rabbits and rats.
 - d. Reproductive Effects: Reproduction studies with MultiHance in rats at daily doses up to 20 times the daily human dose showed no evidence of impaired fertility or harm to the fetus.
 - e. Toxicological Synergistic Products: Co-administration of isosorbide, epirubicin, diazepam, clonazepam, prednisolone and promethazine did not change the acute toxicity of MultiHance after injection in rats.

SECTION 12: ECOLOGICAL INFORMATION

1. Ecotoxicological Information: Not available.
2. Chemical Fate Information: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of in accordance with all local, state and federal regulations or with the regulations of the country in which the material is used.

SECTION 14: TRANSPORT INFORMATION

1. Domestic

- a. Proper Shipping Name: Not classified.
- b. Hazard Class, UN Number, Packing Group: Not classified.
- c. Label Requirements: Not applicable.
- d. Placard Requirements: Not applicable.

2. International

- a. Proper Shipping Name: Not classified.
- b. Hazard Class, UN Number, Packing Group: Not classified.
- c. Label Requirements: Not applicable.
- d. Placard Requirements: Not applicable.

SECTION 15: REGULATORY/STATUTORY INFORMATION (limited to health, safety, environmental)

NOTE: Not meant to be all-inclusive.

- 1. U.S. Federal: None noted.
- 2. International: None noted.
- 3. EC Labeling: Not applicable.

SECTION 16: OTHER INFORMATION

November 29, 2004: New MSDS for MultiHance developed by Bracco Diagnostics Inc.

Diagnostic agents are intended for use under direction of a physician and only under the conditions of use described on the label. As a general precaution, personnel who handle these products should avoid contact (ingestion, inhalation, skin and eye contact) with them.

This material safety data sheet is intended for use by personnel who handle this material as part of their job responsibilities and it does not address the diagnostic use of this material. Information concerning the use of this diagnostic agent should be obtained from the product package insert and other appropriate references.

The information contained in this MSDS was obtained by Bracco Diagnostics Inc. from sources, which we believed to be accurate and reliable and represents the best information currently on file and known by Bracco. However, Bracco makes no representation, guaranty or warranty, express or implied, with respect to any such information, and specifically disclaims and assumes no liability resulting from the use, misuse or mishandling of either the product or this MSDS.