

Material Safety Data Sheet

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1. Identification of the substance/mixture and of the company/undertaking

Product name: KODAK Reversal Agent, RA-1

Product code: 1856996

Supplier: Carestream Health, Inc., 150 Verona Street, Rochester, New York 14608; Carestream Health Canada Company, 6 Monogram Place, Suite 200, Toronto, Ontario, M9R 0A1

For Emergency Health Information call, (800) 424-9300

For other information contact 800-328-2910.

Synonyms: PCD 14075, 14075

Product Use: Professional photographic processing chemical
For industrial use only.

2. Hazards identification

CONTAINS: Tert-butylamine borane (7337-45-3)

DANGER!

POISON

MAY BE FATAL OR HARMFUL IF INHALED

MAY BE FATAL IF SWALLOWED

HARMFUL IF ABSORBED THROUGH SKIN

CAUSES SKIN AND EYE IRRITATION

FLAMMABLE SOLID

REACTS WITH WATER

CONTENTS MAY DEVELOP PRESSURE IF EXPOSED TO WATER

CONTACT WITH WATER LIBERATES TOXIC GAS

CONTACT WITH ACID LIBERATES FLAMMABLE MATERIAL

CONTACT WITH ACID LIBERATES TOXIC GAS

HEAT SENSITIVE - CAN DECOMPOSE IF HEATED

POWDERED MATERIAL MAY FORM EXPLOSIVE DUST-AIR MIXTURES

NFPA Hazard Ratings: Health - 3, Flammability - 3, Instability - 2, Water Reactive

NOTE: NFPA 704 (2001) hazard indexes involves data review and interpretation that may vary among companies. It is intended only for rapid, general identification of the magnitude of the potential hazards. To adequately address safe handling, ALL information in this MSDS must be considered.

3. Composition/information on ingredients

Weight %	Components (CAS-No.)
100	Tert-butylamine borane (7337-45-3)

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4. First aid measures

Inhalation: If inhaled, move to fresh air. Call a physician or poison control center immediately. If not breathing, give artificial respiration using mouth guards or shields, when available, to avoid mouth-to-mouth contact. If breathing is difficult, give oxygen.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes.

Ingestion: If swallowed, only induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

5. Fire-fighting measures

Extinguishing Media: Water spray, Carbon dioxide (CO₂), Dry chemical. Do not use halogenated fire extinguishing agents. Use water spray to cool unopened containers. Water may be ineffective.

Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing. Fire or excessive heat may produce hazardous decomposition products. USE WATER WITH CAUTION. Material reacts with water. Water may be ineffective. Use water spray to cool unopened containers.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides (NO_x), (see also Hazardous Decomposition Products section).

Unusual Fire and Explosion Hazards: Flammable solid. Can be ignited easily and burns vigorously. Contact with water liberates highly flammable gases. Contact with water liberates toxic gas. Contact with moisture or water may generate sufficient heat to ignite nearby combustible materials. Elevated temperature can cause decomposition. Dust may form explosive mixture in air.

6. Accidental release measures

Methods for cleaning up: Remove all sources of ignition. Shovel into suitable container for disposal. Avoid dust formation. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Personal precautions: If accidentally mixed with a strong oxidizer, acid or water, do not breathe gas. Do not breathe dust. Use only with adequate ventilation. Keep container tightly closed. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.

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Prevention of Fire and Explosion: Keep away from open flames, hot surfaces and sources of ignition. Keep from any contact with water. Do not allow water to get into container because of reaction. Allow a minimum of 10% free volume in closed containers. Exercise caution if heating, especially in a closed container. Dust may form explosive mixture in air. Minimize dust generation and accumulation. Use only with adequate ventilation. Refer to NFPA 654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids." Keep from contact with oxidizing materials.

Storage: Store in polyethylene containers. Do not store in glass. Store in cool place. Keep container tightly closed and dry. Keep away from water. Contents may develop pressure if exposed to water. May liberate hydrogen and diborane during storage. Protect against light. Keep away from incompatible substances (see Incompatibility section.)

8. Exposure controls / personal protection

Occupational exposure controls

Chemical Name	Regulatory List	Value Type	Value
Diborane	ACGIH	time weighted average	0.1 ppm
	OSHA Z1	Permissible exposure limit	0.1 ppm 0.1 mg/m ³

Ventilation: Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. Controls should be sufficient so that applicable occupational exposure limits are not exceeded.

Respiratory protection: If engineering controls do not maintain airborne concentrations below recommended exposure limits, an approved respirator must be worn. Respirator type: full-face positive-pressure air-supplied. A full-face positive-pressure air-supplied respirator must be worn if hazardous decomposition products are likely to be released or have been released. See Stability and Reactivity Section. If respirators are used, a program should be instituted to assure compliance with applicable federal, state, commonwealth, provincial, or local laws and regulations.

Eye protection: Wear safety glasses with side shields (or goggles).

Skin and body protection: Wear impervious gloves and protective clothing appropriate for the risk of exposure.

Recommended Decontamination Facilities: Safety shower, eye wash, washing facilities as appropriate to condition of use.

9. Physical and Chemical Properties

Physical form: solid (crystalline)

Colour: white

Odour: amine

Specific gravity: 0.87

Vapour pressure: No data available

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Vapour density: No data available

Volatile fraction by weight: No data available

Melting point/range: Decomposes

Water solubility: Decomposes in contact with water.

pH: not applicable

Flash point: not applicable

Autoignition temperature: 135.0 °C (275.0 °F)

10. Stability and reactivity

Stability: Stable under normal conditions. Safe handling temperatures are dependent on specific conditions of use and are typically substantially below the onset temperature. Consult your technical safety experts.

Exotherm onset temperature: 112 °C by DSC

Incompatibility: Strong oxidizing agents, Water, Strong acids, Halogenated compounds. Material reacts with water. Contact with water liberates toxic, extremely flammable gas. Pressure may develop in container if contents are exposed to water. Contact with acid liberates flammable material. Contact with acids liberates toxic gas. Contact with water or acids liberates hydrogen and diborane.

Hazardous decomposition products: diborane gas, hydrogen.

Hazardous Polymerization: Hazardous polymerization does not occur.

11. Toxicological information

Effects of Exposure

Inhalation: May be fatal or harmful if inhaled. If diborane gas is liberated at concentrations above recommended exposure limits due to contact with a strong oxidizer, acid, or water, it may cause respiratory tract irritation, drowsiness, chest tightness, coughing, wheezing, pulmonary edema, and death. Effects may be delayed.

Eyes: Causes eye irritation.

Skin: Causes skin irritation. Harmful if absorbed through skin.

Ingestion: May be fatal if swallowed. May cause convulsions.

Acute Toxicity Data:

- Oral LD50 (rat): 25 mg/kg
- Dermal LD50: > 1,000 mg/kg
- Skin irritation: moderate

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- Eye irritation: moderate

12. Ecological information

The following properties are ESTIMATED from the components of the preparations.

Potential Toxicity:

Fish LC50:	10 - 100 mg/l
Daphnid EC50:	10 - 100 mg/l
Algal IC50:	< 1 mg/l
Waste treatment organisms EC50:	10 - 100 mg/l
Organics Readily Degradable:	Not readily biodegradable
Potential Bioaccumulation:	log Pow 0.68
COD (approximate):	1923 g/l
BOD (approximate):	270 g/l

13. Disposal considerations

Discharge, treatment, or disposal may be subject to federal, state, commonwealth, provincial, or local laws. Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. Transport information

The information given below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions. Please consult the product packaging for further details.

IATA:	UN Number:	UN3179
	Proper shipping name:	Flammable solid, toxic, inorganic, n.o.s. (Tert-butylamine borane)
	Class:	4.1
	Sub-risks:	6.1
	Packaging group:	II
IMDG:	UN Number:	UN3179
	Proper shipping name:	FLAMMABLE SOLID, TOXIC, INORGANIC, N.O.S. (Tert-butylamine borane)
	Class:	4.1
	Sub-risks:	6.1
	Packaging group:	II

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US DOT:	UN Number:	UN3179
	Proper shipping name:	Flammable solid, toxic, inorganic, n.o.s. (Tert-butylamine borane)
	Class:	4.1
	Sub-risks:	6.1
	Packaging group:	II

For more transportation information, go to: <http://ship.carestreamhealth.com>.

15. Regulatory information

U.S. California Prop. 65: none

Carcinogenicity Classification (components present at 0.1% or more):

International Agency for Research on Cancer (IARC): none
American Conference of Governmental Industrial Hygienists (ACGIH): none
U.S. National Toxicology Program (NTP): none
U.S. Occupational Safety and Health Administration (OSHA): none

Chemical(s) subject to the reporting requirements of U.S. Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372:
none

16. Other information

The data below reflects current legislative requirements whereas the product in your possession may carry a different version of the label depending on the date of manufacture.

US/Canadian Label Statements:

CONTAINS: Tert-butylamine borane (7337-45-3)

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If accidentally mixed with a strong oxidizer, acid or water, do not breathe gas.

Do not breathe dust.

Use only with adequate ventilation.

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Keep away from heat, sparks, and flame.
Store in original tightly closed container.
Store in a cool place.
Minimize dust generation and accumulation.
Do not get in eyes, on skin, or on clothing.
Wash thoroughly after handling.

FIRST AID: If inhaled, move to fresh air. Call a physician or poison control center immediately. If not breathing, give artificial respiration using mouth guards or shields, when available, to avoid mouth-to-mouth contact. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash contaminated clothing before re-use. Destroy or thoroughly clean contaminated shoes. If swallowed, only induce vomiting as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately.

Keep out of reach of children.

Do not handle or use until safety precautions in Material Safety Data Sheet (MSDS) have been read and understood.

Since emptied containers retain product residue, follow label warnings even after container is emptied.

IN CASE OF FIRE: Use Water spray, Carbon dioxide (CO₂), Dry chemical. Do not use halogenated fire extinguishing agents. Use water spray to cool unopened containers. Water may be ineffective.

IN CASE OF SPILL: Remove all sources of ignition. Shovel into suitable container for disposal. Avoid dust formation. Clean surface thoroughly to remove residual contamination.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment. The information relating to the working solution is for guidance purposes only, and is based on correct mixing and use of the product according to instructions.

R-3, S-2, F-3, C-2HWT