



chemists helping chemists in research & industry

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ATTN JOEL WATKINS
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EMERGENCY PHONE 1-414-273-3850
PO BOX 355 MILWAUKEE, WI 52301
DATE 08/13/96
CUST#: 938609
PO#: B15436

M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 1

SECTION 1. - - - - - CHEMICAL IDENTIFICATION - - - - -

CATALOG #: 20788-8
NAME: BROMINE

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - -

CAS #: 7726-95-6
MF: BR2
EC NO: 231-778-1

SYNONYMS

BROM (GERMAN) * BROME (FRENCH) * BROMINE (ACGIH:DOT:OSHA) * BROMINE
SOLUTIONS (DOT) * BROMO (ITALIAN) * BROOM (DUTCH) * DIBROMINE *
UN1744 (DOT) *

SECTION 3. - - - - - HAZARDS IDENTIFICATION - - - - -

LABEL PRECAUTIONARY STATEMENTS

HIGHLY TOXIC (USA)
VERY TOXIC (EU)
CORROSIVE
CONTACT WITH COMBUSTIBLE MATERIAL MAY CAUSE FIRE.
VERY TOXIC BY INHALATION.
CAUSES SEVERE BURNS.
LACHRYMATOR.
KEEP CONTAINER TIGHTLY CLOSED AND IN WELL-VENTILATED PLACE.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF
WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE
PROTECTION.
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

SECTION 4. - - - - - FIRST-AID MEASURES - - - - -

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
CLOTHING AND SHOES.
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS
WITH FINGERS.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN IMMEDIATELY.

CONTINUED ON NEXT PAGE

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M A T E R I A L S A F E T Y D A T A S H E E T

PAGE 2

CATALOG #: 20788-8
NAME: BROMINE

DISCARD CONTAMINATED CLOTHING AND SHOES.

SECTION 5. - - - - - FIRE FIGHTING MEASURES - - - - -

EXTINGUISHING MEDIA
NONCOMBUSTIBLE.

SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO
PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS
VIGOROUSLY SUPPORTS COMBUSTION.
CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.
CONTAINER EXPLOSION MAY OCCUR UNDER FIRE CONDITIONS.

SECTION 6. - - - - - ACCIDENTAL RELEASE MEASURES - - - - -

EVACUATE AREA.
USE ONLY IN A CHEMICAL FUME HOOD.
COVER WITH DRY-LIME, SAND, OR SODA ASH. PLACE IN COVERED CONTAINERS
USING NON-SPARKING TOOLS AND TRANSPORT OUTDOORS.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - HANDLING AND STORAGE - - - - -

REFER TO SECTION 8.

SECTION 8. - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION - - - - -

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT
GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
USE ONLY IN A CHEMICAL FUME HOOD.
SAFETY SHOWER AND EYE BATH.
FACESHIELD (8-INCH MINIMUM).
DO NOT BREATHE VAPOR.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
HIGHLY TOXIC.
LACHRYMATOR.
CORROSIVE.
HARMFUL VAPOR.
KEEP TIGHTLY CLOSED.
DO NOT STORE NEAR, NOR ALLOW CONTACT WITH, CLOTHING AND OTHER
COMBUSTIBLE MATERIAL.
MAY DEVELOP PRESSURE.

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PAGE 3

CATALOG #: 20788-8
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STORE AWAY FROM HEAT AND DIRECT SUNLIGHT.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - -

APPEARANCE AND ODOR
DARK-RED LIQUID

PHYSICAL PROPERTIES

BOILING POINT: 58.8 C
MELTING POINT: -7.2 C
FLASHPOINT: NONE
VAPOR PRESSURE: 175MM 20 C 671MM 55 C
SPECIFIC GRAVITY: 3.119
VAPOR DENSITY: 7.14

SECTION 10. - - - - - STABILITY AND REACTIVITY - - - - -

INCOMPATIBILITIES

REDUCING AGENTS
ALKALI METALS
FINELY POWDERED METALS
ALUMINUM
CORRODES STEEL
STAINLESS STEEL
GALVANIZED IRON
COPPER, COPPER ALLOYS
ORGANIC MATERIALS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

SECTION 11. - - - - - TOXICOLOGICAL INFORMATION - - - - -

ACUTE EFFECTS

MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN.
CAUSES BURNS.
MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES
AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
INHALATION MAY BE FATAL AS A RESULT OF SPASM, INFLAMMATION AND EDEMA
OF THE LARYNX AND BRONCHI, CHEMICAL PNEUMONITIS AND PULMONARY EDEMA.
SYMPTOMS OF EXPOSURE MAY INCLUDE BURNING SENSATION, COUGHING,
WHEEZING, LARYNGITIS, SHORTNESS OF BREATH, HEADACHE, NAUSEA AND
VOMITING.

RTECS #: EF9100000
BROMINE

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PAGE 4

CATALOG #: 20788-8
NAME: BROMINE

TOXICITY DATA

DRL-HMN LDLO:14 MG/KG
IHL-HMN LCLO:1000 PPM
DRL-RAT LD50:2600 MG/KG
IHL-RAT LC50:2700 MG/M3
DRL-MUS LD50:3100 MG/KG
IHL-MUS LC50:750 PPM/9M
DRL-RBT LD50:4160 MG/KG
DRL-GPG LD50:5500 MG/KG
DRL-MAM LD50:440 MG/KG

34Z1AG -,645,69
34Z1AG -,645,69
GISAAA 35(11),11,70
GTPZAB 20(3),36,76
GISAAA 35(11),11,70
AIHAAP 39,129,78
GISAAA 35(11),11,70
GISAAA 35(11),11,70
GISAAA 39(4),86,74

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR
COMPLETE INFORMATION.

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CAUTIOUSLY ACIDIFY A 3% SOLUTION OR A SUSPENSION OF THE MATERIAL TO
PH 2 WITH SULFURIC ACID. GRADUALLY ADD A 50% EXCESS OF AQUEOUS SODIUM
BISULFITE WITH STIRRING AT ROOM TEMPERATURE. AN INCREASE IN TEMPERA-
TURE INDICATES THAT A REACTION IS TAKING PLACE. IF NO REACTION IS
OBSERVED ON THE ADDITION OF ABOUT 10% OF THE SODIUM BISULFITE SOLUTION
INITIATE IT BY CAUTIOUSLY ADDING MORE ACID. IF MANGANESE, CHROMIUM,
OR MOLYBDENUM ARE PRESENT ADJUST THE PH OF THE SOLUTION TO 7 AND TREAT
WITH SULFIDE TO PRECIPITATE FOR BURIAL AS HAZARDOUS WASTE. DESTROY
EXCESS SULFIDE, NEUTRALIZE AND FLUSH THE SOLUTION DOWN THE DRAIN.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION

EC INDEX NO: 035-001-00-5
VERY TOXIC
CORROSIVE
R 26
VERY TOXIC BY INHALATION.
R 35
CAUSES SEVERE BURNS.
S 7/9

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PAGE 5

CATALOG #: 20788-8
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KEEP CONTAINER TIGHTLY CLOSED AND IN WELL-VENTILATED PLACE.

S₂₆
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.

S_{36/37/39}
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

S₄₅
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

REVIEWS, STANDARDS, AND REGULATIONS

DEL=MAK
ACGIH TLV-TWA 0.1 PPM; STEL 0.3 PPM 85INA8 6,150.91
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
FEREAC 54,7740.89
MSHA STANDARD-AIR: TWA 0.1 PPM (0.7 MG/M3)
DTLVS* 3,27.71
OSHA PEL (GEN INDU): 8H TWA 0.1 PPM (0.7 MG/M3)
CFRGBR 29,1910.1000.94
OSHA PEL (CONSTRUC): 8H TWA 0.1 PPM (0.7 MG/M3)
CFRGBR 29,1926.55.94
OSHA PEL (SHIPYARD): 8H TWA 0.1 PPM (0.7 MG/M3)
CFRGBR 29,1915.1000.93
OSHA PEL (FED CONT): 8H TWA 0.1 PPM (0.7 MG/M3)
CFRGBR 41,50-204.50.94
DEL-ARAB REPUBLIC OF EGYPT: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-AUSTRALIA: TWA 0.1 PPM (0.7 MG/M3); STEL 0.3 PPM (2 MG/M3) JAN93
DEL-AUSTRIA: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-BELGIUM: TWA 0.1 PPM (0.66 MG/M3); STEL 0.3 PPM (2 MG/M3) JAN93
DEL-DENMARK: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-FINLAND: STEL 0.1 PPM (0.7 MG/M3); SKIN JAN93
DEL-FRANCE: STEL 0.1 PPM (0.7 MG/M3) JAN93
DEL-GERMANY: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-HUNGARY: STEL 0.7 MG/M3; SKIN JAN93
DEL-INDIA: TWA 0.1 PPM (0.7 MG/M3); STEL 0.3 PPM (2 MG/M3) JAN93
DEL-JAPAN: TWA 0.1 PPM (0.65 MG/M3) JAN93
DEL-THE NETHERLANDS: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-THE PHILIPPINES: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-POLAND: TWA 0.7 MG/M3 JAN93
DEL-RUSSIA: TWA 0.1 PPM; STEL 0.5 MG/M3 JAN93
DEL-SWEDEN: TWA 0.1 PPM (0.7 MG/M3); STEL 0.3 PPM (2 MG/M3) JAN93
DEL-SWITZERLAND: TWA 0.1 PPM (0.7 MG/M3); STEL 0.2 PPM (1.4 MG/M3) JAN93
DEL-TURKEY: TWA 0.1 PPM (0.7 MG/M3) JAN93
DEL-UNITED KINGDOM: TWA 0.1 PPM (0.7 MG/M3); STEL 0.3 PPM JAN93
DEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV

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PAGE 6

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DEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO BROMINE-AIR:10H TWA 0.1 PPM;STEL 0.3 PPM
NIOSH* DHHS #92-100,92
NOHS 1974: HZD 13100; NIS 17; TNF 583; NOS 16; TNE 23977
NOES 1983: HZD 13100; NIS 40; TNF 1679; NOS 55; TNE 62214; TFE 10780
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, APRIL 1996
NIOSH ANALYTICAL METHOD, 1994: BROMINE AND CHLORINE, 6011
OSHA ANALYTICAL METHOD #ID-108

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.

SECTION 16. - - - - - OTHER INFORMATION - - - - -

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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