



JUN 07 1999

SIGMA-ALDRICH

ALDRICH CHEMICAL COMPANY, INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201, USA

ATTN: SAFETY DIRECTOR
MARY PINKERTON/CREDIT CARD ORD
UNIVERSITY OF WISCONSIN WHITEWATER
P O BOX 296
WHITEWATER WI 53190

EMERGENCY PHONE 1-414-273-3850

DATE 06/01/99
CUST#: 523216
PO#: CC/2444G REQ

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 #: 21346-2
NAME: SODIUM BOROXYDRIDE, 99%

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

CAS #: 16940-66-2
MF: H4BNA
EC NO: 241-004-4

SYNONYMS

BOROXYDRURE DE SODIUM (FRENCH) * BOROL * HIDKITEX DF * SODIUM
BOROXYDRATE * SODIUM HYDROBORATE * SODIUM TETRAHYDRIDOBORATE(1-) *
SODIUM TETRAHYDROBORATE(1-) *

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

LABEL PRECAUTIONARY STATEMENTS

FLAMMABLE (USA)
HIGHLY FLAMMABLE (EU)
TOXIC
CONTACT WITH WATER LIBERATES EXTREMELY FLAMMABLE GASES.
TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
CAUSES BURNS.
IN CASE OF FIRE, USE DRY POWDER. NEVER USE WATER.
KEEP CONTAINER TIGHTLY CLOSED AND DRY.
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE
PROTECTION.
MOISTURE SENSITIVE

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.
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.
DISCARD CONTAMINATED CLOTHING AND SHOES.

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

EXTINGUISHING MEDIA

DO NOT USE:
WET CHEMICAL
WATER

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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 P A G E 2

CATALOG #: 21346-2
NAME: SODIUM BOROHYDRIDE, 99%

CARBON DIOXIDE.
HALOCARBONS
USE:
DRY CHEMICAL POWDER.
SODA ASH
DOLOMITE
DRY SAND

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

UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
MATERIAL READILY REACTS WITH WATER GENERATING FLAMMABLE AND/OR
EXPLOSIVE HYDROGEN GAS.
REACTS WITH WATER TO LIBERATE FLAMMABLE AND/OR EXPLOSIVE GAS.

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

EVACUATE AREA.
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY
RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

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

REFER TO SECTION 8.

ADDITIONAL INFORMATION

SODIUM BOROHYDRIDE IN DIMETHYLFORMAMIDE (DMF) WILL UNDERGO RUNAWAY
THERMAL REACTIONS RESULTING IN VIOLENT DECOMPOSITIONS. AN INDUCTION
PERIOD IS INVOLVED AND IT IS TEMPERATURE DEPENDENT, E.G., 45 HOURS AT
62 C AND 45 MINUTES AT 90 C. THE TEMPERATURE CAN REACH THE
AUTOIGNITION TEMPERATURE (190 C) OF TRIMETHYLAMINE, THE REACTION BY-
PRODUCT. THE ADDITION OF SUPPORTED NOBLE METAL CATALYSTS TO SOLUTIONS
OF SODIUM BOROHYDRIDE CAN RESULT IN IGNITION OF LIBERATED HYDROGEN
GAS. THE REDUCTION OF RUTHENIUM SALTS SOLUTIONS WITH BOROHYDRIDE
SOLUTIONS TO GIVE THE METAL OR AN ALLOY GAVE SOLID PRODUCTS WHICH
WERE DRIED AND SUBSEQUENTLY EXPLODED WHEN DISTURBED BY A SPATULA OR
ON CONTACT WITH WATER.
MIXING SOLID SODIUM BOROHYDRIDE WITH CHARCOAL (ACTIVATED CARBON) IN
AIR PROMOTES THE OXIDATION OF THE SODIUM BOROHYDRIDE, PRODUCING A SELF-
HEATING REACTION THAT MAY RESULT IN THE IGNITION OF THE CHARCOAL AND
IN PRODUCTION OF HYDROGEN THROUGH THERMAL DECOMPOSITION OF SODIUM
BOROHYDRIDE. THE SPONTANEOUS COMBUSTION IN AIR OCCURS AT 90-100'C. THE
PRESENCE OF MOISTURE IN THE AIR CAUSES THE IGNITION TO OCCUR MORE
READILY.

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

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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 DUST.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
KEEP TIGHTLY CLOSED.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.
STORE IN A COOL DRY PLACE.

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

APPEARANCE AND ODOR
WHITE POWDER

PHYSICAL PROPERTIES
MELTING POINT: 400 C (DEC)
EXPLOSION LIMITS IN AIR:
LOWER 3.02%
SPECIFIC GRAVITY: 1.074

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

STABILITY
STABLE.

INCOMPATIBILITIES
OXIDIZING AGENTS
ACIDS
MAY DECOMPOSE ON EXPOSURE TO MOIST AIR OR WATER.
CHEMICALLY ACTIVE METALS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
BORANE/BORON OXIDES
SODIUM OXIDE

HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.

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

ACUTE EFFECTS
TOXIC BY INHALATION, INGESTION OR SKIN ABSORPTION.
MATERIAL IS EXTREMELY DESTRUCTIVE TO TISSUE OF THE MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT, EYES AND SKIN.
INHALATION MAY RESULT IN 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

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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 P A G E 4

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VOMITING.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

RTECS #: ED3325000
BORATE(1-), TETRAHYDRO-, SODIUM

TOXICITY DATA
IPR-RAT LD50:18 MG/KG AMIHAB 17,124,1958
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 - - - - -
CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF
THIS MATERIAL.
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
HIGHLY FLAMMABLE
TOXIC
R 15
CONTACT WITH WATER LIBERATES EXTREMELY FLAMMABLE GASES.
R 23/24/25
TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
R 34
CAUSES BURNS.
HIGHLY FLAMMABLE
S 43
IN CASE OF FIRE, USE DRY POWDER. NEVER USE WATER.
S 7/8
KEEP CONTAINER TIGHTLY CLOSED AND DRY.
S 45
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).
S 36/37/39
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE
PROTECTION.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK

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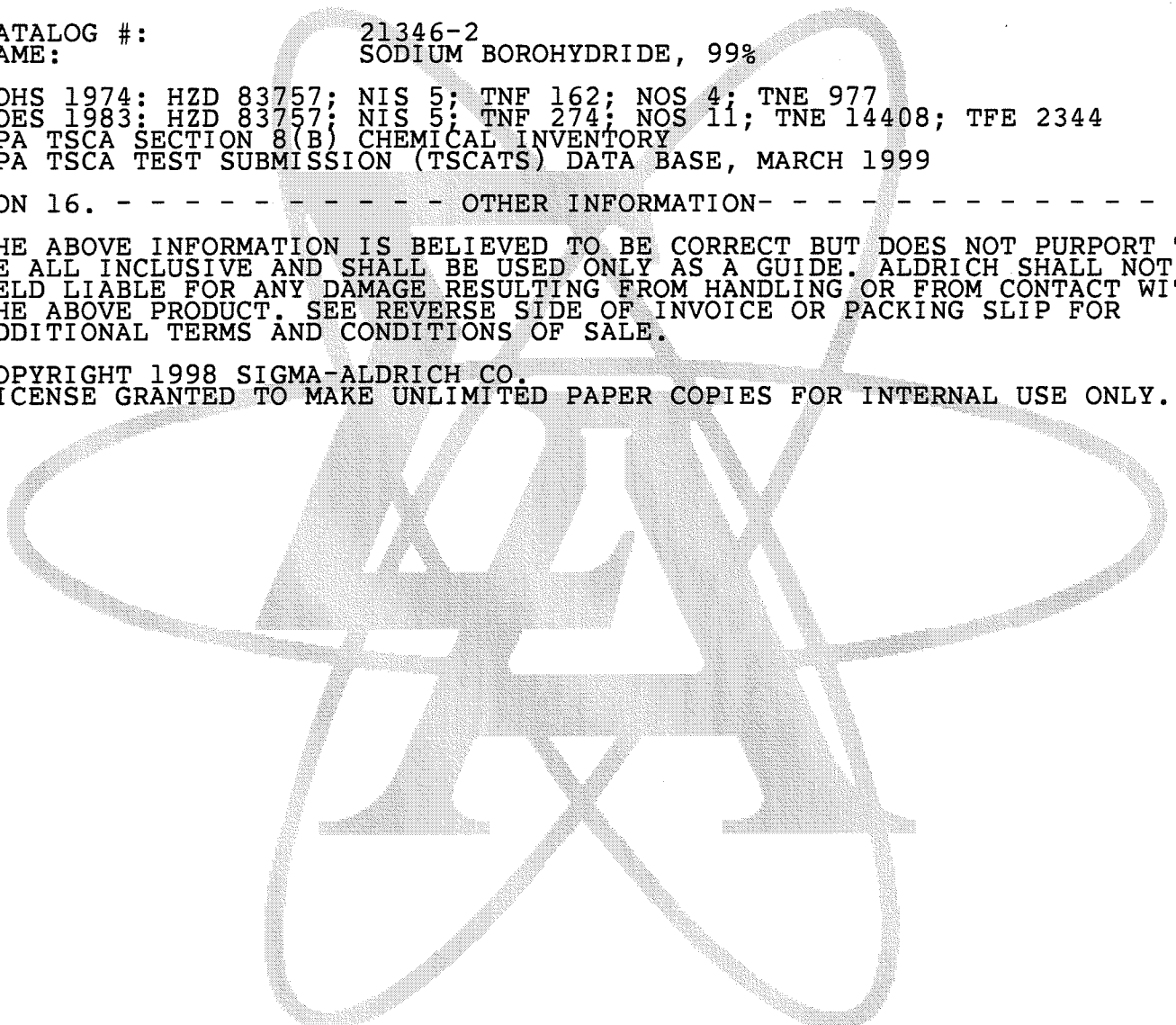
M A T E R I A L S A F E T Y D A T A S H E E T P A G E 5

CATALOG #: 21346-2
NAME: SODIUM BOROHYDRIDE, 99%
NOHS 1974: HZD 83757; NIS 5; TNF 162; NOS 4; TNE 977
NOES 1983: HZD 83757; NIS 5; TNF 274; NOS 11; TNE 14408; TFE 2344
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, MARCH 1999

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

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