

SIGMA



CHEMICAL COMPANY

THE WORLD'S FOREMOST MANUFACTURER OF RESEARCH
BIOCHEMICALS AND DIAGNOSTIC REAGENTS

POST OFFICE BOX 14508
SAINT LOUIS, MISSOURI 63178, USA

FAX: USA/CANADA 1-800-325-5052 OUTSIDE USA/CANADA 314-771-5757
TELEX: 910-761-0593 or 434475 ANSWERBACK "SIG OK COLLECT"

TELEPHONE: USA/CANADA 1-800-325-3010
OUTSIDE USA/CANADA call COLLECT 314-771-5750

ATTN: SAFETY DIRECTOR
SCHOOLCRAFT COLLEGE
18600 HAGGERTY ROAD
LIVONIA MI 48152-3932

EMERGENCY PHONE 1-314-771-5765

DATE: 08/29/95
CUST#: 2-043-15940
PO#: 80407

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 - - - - -

PRODUCT #: M3138

NAME: MANGANESE DIOXIDE

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

CAS #: 1313-13-9

MF: MN102

SYNONYMS

BLACK MANGANESE OXIDE * BOG MANGANESE * BRAUNSTEIN (GERMAN) *
BRUINSTEEN (DUTCH) * CEMENT BLACK * C.I. 77728 * C.I. PIGMENT BLACK
14 * C.I. PIGMENT BROWN 8 * MANGAANBIOXYDE (DUTCH) * MANGAANDIOXYDE
(DUTCH) * MANGANDIOXID (GERMAN) * MANGANESE BINOXIDE * MANGANESE
(BIOSSIDO DI) (ITALIAN) * MANGANESE (BIOXYD DE) (FRENCH) * MANGANESE
BLACK * MANGANESE (DIOSSIDO DI) (ITALIAN) * MANGANESE (DIOXYDE DE)
(FRENCH) * MANGANESE OXIDE * MANGANESE (IV) OXIDE * MANGANESE
PEROXIDE * MANGANESE SUPEROXIDE * PYROLUSITE BROWN *

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

LABEL PRECAUTIONARY STATEMENTS

OXIDIZING

HARMFUL

CONTACT WITH COMBUSTIBLE MATERIAL MAY CAUSE FIRE.

HARMFUL BY INHALATION AND IN CONTACT WITH SKIN.

IRRITATING TO EYES AND SKIN.

TARGET ORGAN(S):

CENTRAL NERVOUS SYSTEM

LUNGS

KEEP AWAY FROM COMBUSTIBLE MATERIAL.

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

WEAR SUITABLE PROTECTIVE CLOTHING.

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

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF
WATER FOR AT LEAST 15 MINUTES.

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS
AMOUNTS OF WATER.

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.

CONTINUED ON NEXT PAGE

BF. OFFICES AT:

SIGMA-ALDRICH
VERTRIEBS GmbH
Grünwalder Weg 30
82041 Deisenhofen
Deutschland

SIGMA CHIMIE
L'ISLE D'Abeau Chesnes
B.P. 701
38297 St. Quentin Fallavier
Cedex
France

SIGMA-ALDRICH QUIMICA, S.A.
Apt. Correo 161
28100 Alcobendas
(Madrid)
España

SIGMA-ALDRICH S.r.l.
Via Gallarate 154
20151 Milano
Italia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

SIGMA-ALDRICH PTY., LIMITED
Unit 2, 10 Anetta Ave.
Castle Hill NSW 2154
Australia

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

PRODUCT #: M3138
MF: MN102

NAME: MANGANESE DIOXIDE

CUST#: 2-043-15940
PD#: 80407

WASH CONTAMINATED CLOTHING BEFORE REUSE.

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

EXTINGUISHING MEDIA
NONCOMBUSTIBLE.

USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

SPECIAL FIREFIGHTING PROCEDURES

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

OXIDIZER.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE.

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

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.

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

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT
GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.

SAFETY SHOWER AND EYE BATH.

MECHANICAL EXHAUST REQUIRED.

DO NOT BREATHE DUST.

AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

AVOID PROLONGED OR REPEATED EXPOSURE.

WASH THOROUGHLY AFTER HANDLING.

IRRITATING DUST.

HARMFUL SOLID.

KEEP TIGHTLY CLOSED.

CONTINUED ON NEXT PAGE

BRANCH OFFICES AT:

SIGMA-ALDRICH VERTRIEBS GmbH Grünwalder Weg 30 82041 Deisenhofen Deutschland	SIGMA-ALDRICH QUIMICA, S.A. Apt. Correos 161 28100 Alcobendas (Madrid) España	SIGMA-ALDRICH S.r.l. Krizkova 27 186 00 Praha 6 Ceská Republika	SIGMA CHEMIE K. Cardijnplein, 8 B-2880 Bornem België/Belgique	SIGMA CHEMIE P.O. Box 260 CH-9470 Buchs Switzerland	SIGMA-ALDRICH QUIMICA, S.A. de C.V. Avenida Picacho Ajusco No. 130-303 Fraccionamiento Jardines en la Montaña 14210 Mexico, D.F.	SIGMA-ALDRICH CORPORATION New Delhi Location B-4/158, Saldarjung Enclave New Delhi - 110 029 India
SIGMA CHIMIE L'ISLE D'Abeau Chesnes B.P. 701 38297 St. Quentin Fallavier Cedex France	SIGMA-ALDRICH S.r.l. Via Gallarate 154 20151 Milano Italia	SIGMA-ALDRICH PTY., LIMITED Unit 2, 10 Anetta Ave. Castle Hill NSW 2154 Australia	SIGMA-ALDRICH CHEMICAL REPRESENTAÇÕES LTDA. Rua Sabara, 566 - Conj. 53 01239-010 São Paulo, SP Brasil	SIGMA CHEMICAL CO. LTD. Fancy Road, Poole Dorset BH17 7NH England	SIGMA-ALDRICH KR Teréz krt. 39 1067 Budapest Hungary	SIGMA-ALDRICH 206 Samhan Campus Building 17-3 Yoido-dong Yungdeungpo-ku Seoul South Korea

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

PAGE 3

PRODUCT #: M3138
MF: MN102

NAME: MANGANESE DIOXIDE

CUST#: 2-043-15940
PO#: 80407

DO NOT STORE NEAR, NOR ALLOW CONTACT WITH, CLOTHING AND OTHER
COMBUSTIBLE MATERIAL.
STORE IN A COOL DRY PLACE.

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

APPEARANCE AND ODOR
BLACK OR GREY POWDER
MELTING POINT: 535 C (DEC)
SPECIFIC GRAVITY: 5.026

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

INCOMPATIBILITIES
STRONG ACIDS
STRONG REDUCING AGENTS
ORGANIC MATERIALS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.

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

ACUTE EFFECTS
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN.
MAY BE HARMFUL IF SWALLOWED.
CAUSES EYE AND SKIN IRRITATION.
TARGET ORGAN(S):
NERVES
LUNGS

ADDITIONAL INFORMATION
MEN EXPOSED TO MANGANESE DUSTS SHOWED A DECREASE IN FERTILITY.
CHRONIC MANGANESE POISONING PRIMARILY INVOLVES THE CENTRAL NERVOUS
SYSTEM. EARLY SYMPTOMS INCLUDE LANGUOR, SLEEPINESS AND WEAKNESS IN
THE LEGS. A STOLID MASK-LIKE APPEARANCE OF THE FACE, EMOTIONAL
DISTURBANCES SUCH AS UNCONTROLLABLE LAUGHTER AND A SPASTIC GAIT WITH
TENDENCY TO FALL IN WALKING ARE FINDINGS IN MORE ADVANCED CASES. HIGH
INCIDENCE OF PNEUMONIA HAS BEEN FOUND IN WORKERS EXPOSED TO THE DUST
OR FUME OF SOME MANGANESE COMPOUNDS.
RTECS NO: OP0350000
MANGANESE DIOXIDE

CONTINUED ON NEXT PAGE

BR. OFFICES AT:

SIGMA-ALDRICH VERTRIEBS GmbH Grünwalder Weg 30 82041 Deisenhofen Deutschland	SIGMA-ALDRICH QUIMICA, S.A. Apt. Correos 161 28100 Alcobendas (Madrid) España	SIGMA-ALDRICH s.r.o. Křižkova 27 196 00 Praha 8 Ceská Republika	SIGMA CHEMIE K. Cardijnplein, 8 B-2880 Bornem België/Belgique	SIGMA CHEMIE P.O. Box 260 CH-9470 Buchs Switzerland	SIGMA-ALDRICH QUIMICA, S.A. de C.V. Avenida Picacho Ajusco No. 130-303 Fraccionamiento Jardines en la Montaña 14210 Mexico, D.F.	SIGMA-ALDRICH CORPORATION New Delhi Location B-4/158, Sardarjung Enclave New Delhi - 110 029 India
SIGMA CHIMIE L'ISLE D'Abeau Chesnes B.P. 701 38297 St. Quentin Fallavier Cedex France	SIGMA-ALDRICH S.r.l. Via Gallarate 154 20151 Milano Italia	SIGMA-ALDRICH PTY., LIMITED Unit 2, 10 Anetta Ave. Castle Hill NSW 2154 Australia	SIGMA-ALDRICH CHEMICAL REPRESENTAÇÕES LTDA. Rua Sabara, 566 - Conj. 53 01239-010 São Paulo, SP Brasil	SIGMA CHEMICAL CO. LTD. Fancy Road, Poole Dorset BH17 7NH England	SIGMA-ALDRICH Kft Terezt krt. 39 1067 Budapest Hungary	SIGMA-ALDRICH 206 Samhan Campus Building 17-3 Yoido-dong Yungdeungpo-ku Seoul South Korea

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

PAGE 4

PRODUCT #: M3138
MF: MN102

NAME: MANGANESE DIOXIDE

CUST#: 2-043-15940
PO#: 80407

TOXICITY DATA

SCU-MUS LD50: 422 MG/KG

ZVKDA6 19,186,74

TARGET ORGAN DATA

LUNGS, THORAX OR RESPIRATION (EMPHYSEMA)

LUNGS, THORAX OR RESPIRATION (ACUTE PULMONARY EDEMA)

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 - - - - -

BURY IN A LANDFILL SITE APPROVED FOR THE DISPOSAL OF CHEMICAL
AND HAZARDOUS WASTES.

OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

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

CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

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

REVIEWS, STANDARDS, AND REGULATIONS

ACGIH TLV-TWA 5 MG(MN)/M3

85INA8 6,876,91

MSHA STANDARD-AIR: CL 5 MG(MN)/M3

DTLVS* 3,149,71

OSHA PEL (GEN INDU): CL 5 MG(MN)/M3

CFRGR 29,1910.1000,94

OSHA PEL (CONSTRUC): CL 5 MG(MN)/M3

CFRGR 29,1926.55,94

OSHA PEL (SHIPYARD): CL 5 MG(MN)/M3

CFRGR 29,1915.1000,93

OSHA PEL (FED CONT): CL 5 MG(MN)/M3

CFRGR 41,50-204.50,94

OEL-AUSTRALIA: TWA 5 MG(MN)/M3 JANUARY 1993

OEL-BELGIUM: TWA 5 MG(MN)/M3 JANUARY 1993

OEL-CZECHOSLOVAKIA: TWA 2 MG(MN)/M3; STEL 6 MG(MN)/M3 JANUARY 1993

OEL-DENMARK: TWA 2.5 MG(MN)/M3 JANUARY 1993

CONTINUED ON NEXT PAGE

BRANCH OFFICES AT:

SIGMA-ALDRICH VERTRIEBS GmbH Grünwälder Weg 30 82041 Detschenhofen Deutschland	SIGMA-ALDRICH QUIMICA, S.A. Apt. Correas 181 28100 Alcobendas (Madrid) España	SIGMA-ALDRICH S.r.l. Via Gallarate 154 20151 Milano Italia	SIGMA-ALDRICH PTY., LIMITED Unit 2, 10 Anella Ave. Castle Hill NSW 2154 Australia	SIGMA CHEMIE K. Cardijnplein, 8 B-2880 Bornem Belgie/Belgique	SIGMA CHEMIE P.O. Box 260 CH-9470 Buchs Switzerland	SIGMA-ALDRICH QUIMICA, S.A. de C.V. Avenida Picacho Ajusco No. 130-303 Fraccionamiento Jardines en la Montaña 14210 Mexico, D.F.	SIGMA-ALDRICH CORPORATION New Delhi Location B-4/158, Saldarjung Enclave New Delhi - 110 029 India
SIGMA CHIMIE L'ISLE D'Abeau Chesnes B.P. 701 38297 St. Quentin Fallavier Cedex France				SIGMA-ALDRICH CHEMICAL REPRESENTAÇÕES LTDA. Rua Sabará, 566 - Conj. 53 01239-010 São Paulo, SP Brasil	SIGMA CHEMICAL CO. LTD. Fancy Road, Poole Dorset BH17 7NH England	SIGMA-ALDRICH KR Terez krt. 39 1067 Budapest Hungary	SIGMA-ALDRICH 206 Samhan Campus Building 17-3 Yoido-dong Yungdeungpo-ku Seoul South Korea

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

PAGE 5

PRODUCT #: M3138
MF: MN102

NAME: MANGANESE DIOXIDE

CUST#: 2-043-15940
PO#: 80407

DEL-FINLAND:TWA 2.5 MG(MN)/M3 JANUARY 1993
DEL-HUNGARY:TWA 0.3 MG(MN)/M3;STEL 0.6 MG(MN)/M3 JANUARY 1993
DEL-JAPAN:TWA 0.3 MG(MN)/M3 JANUARY 1993
DEL-THE NETHERLANDS:TWA 1 MG(MN)/M3 JANUARY 1993
DEL-POLAND:TWA 0.3 MG(MN)/M3 JANUARY 1993
DEL-SWEDEN:TWA 1 MG(MN)/M3;STEL 2.5 MG(MN)/M3 (RESP. DUST) JAN93
DEL-SWEDEN:TWA 2.5 MG(MN)/M3;STEL 5 MG(MN)/M3 (TOTAL DUST) JAN93
DEL-UNITED KINGDOM:TWA 10 MG/M3 (TOTAL DUST) JAN93
DEL-UNITED KINGDOM:TWA 5 MG(MN)/M3 JANUARY 1993
DEL-UNITED KINGDOM:TWA 5 MG/M3 (FUME AND RESPIRABLE DUST) JAN93
DEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV
DEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NQS 1974: HZD 44030; NIS 48; TNF 3820; NOS 60; TNE 53685
NQS 1983: HZD 44030; NIS 41; TNF 3347; NOS 50; TNE 71963; TFE 15526
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, APRIL 1995
THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS -
MANGANESE COMPOUNDS.

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. SIGMA 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.

COPYRIGHT 1995 SIGMA CHEMICAL CO.
LICENSE GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.

OFFICES AT:

SIGMA-ALDRICH VERTRIEBS GmbH Grünwälder Weg 30 82041 Dissenhofen Deutschland	SIGMA-ALDRICH QUIMICA, S.A. Apt. Correos 161 28100 Alcobendas (Madrid) España	SIGMA-ALDRICH S.r.l. Krizkova 27 186 00 Praha 8 Ceská Republika	SIGMA CHEMIE K. Carolinplein, 8 B-2880 Bornem België/Belgique	SIGMA CHEMIE P.O. Box 260 CH-9470 Buchs Switzerland	SIGMA-ALDRICH QUIMICA, S.A. de C.V. Avenida Picacho Ajusco No. 130-303 Fraccionamiento Jardines en la Montaña 14210 Mexico, D.F.	SIGMA-ALDRICH CORPORATION New Delhi Location B-4/158, Sakdaryung Enclave New Delhi - 110 029 India
SIGMA CHIMIE L'ISLE D'Abeau Chesnes B.P. 701 38297 St. Quentin Fallavier Cedex France	SIGMA-ALDRICH S.r.l. Via Gallarate 154 20151 Milano Italia	SIGMA-ALDRICH PTY., LIMITED Unit 2, 10 Anella Ave. Castle Hill NSW 2154 Australia	SIGMA-ALDRICH CHEMICAL REPRESENTAÇÕES LTDA. Rua Sabará, 566 - Conj. 53 01239-010 São Paulo, SP Brasil	SIGMA CHEMICAL CO. LTD. Fancy Road, Poole Dorset BH17 7NH England	SIGMA-ALDRICH KR Tenzs krt. 39 1067 Budapest Hungary	SIGMA-ALDRICH 206 Samhan Campus Building 17-3 Yoido-dong Yungdeungpo-ku Seoul South Korea