MATERIAL SAFETY DATA SHEET

THIS MSDS IS FOR A COMPONENT OF CATALOG #: LAA-21

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

CATALOG #: C7755
NAME: L-CYSTEINE FREE BASE CRYSTALLINE

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

CAS #: 52-90-4
MF: C3H7N02S1
EC NO: 200-158-2

SYNONYMS:
CYSTEIN * CYSTEINE * L-CYSTEINE (OCl) * L-(+)-CYSTEINE * HALF-
CYSTEINE * HALF-CYSTEINE * BETA-MERCAPTOALANINE * THISERINE *

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

LABEL PRECAUTIONARY STATEMENTS

HARMFUL
HARMFUL IF SWALLOWED.
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
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.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

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

EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

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

UNCHAL FIRE AND EXPLOSIONS HAZARDS

CONTINUED ON NEXT PAGE
MATERIAL SAFETY DATA SHEET

THIS MSDS IS FOR A COMPONENT OF CATALOG #: LAA-21

CATALOG #: C7755
NAME: L-CYSTEINE FREE BASE CRYSTALLINE

EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. ACCIDENTAL RELEASE MEASURES

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, 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 9.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
DO NOT BREATHE DUST.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
HARMFUL SOLID.
IRRITANT.
KEEP TIGHTLY CLOSED.
REFRIGERATE.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOOR
WHITE CRYSTALLINE POWDER

PHYSICAL PROPERTIES
MELTING POINT: 220 C (DEC)

SECTION 10. STABILITY AND REACTIVITY

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
SULFUR OXIDES

SECTION 11. TOXICOLOGICAL INFORMATION

ACUTE EFFECTS
HARMFUL IF SWALLOWED.

CONTINUED ON NEXT PAGE
MATERIAL SAFETY DATA SHEET

THIS MSDS IS FOR A COMPONENT OF CATALOG #: LAA-21

CATALOG #: C7755
NAME: L-CYSTEINE FREE BASE CRYSTALLINE

MAY BE HARMFUL IF INHALED.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

RTECS #: HA1600000
CYSTEINE, L-

TOXICITY DATA

DRL-RAT LO50:1890 MG/KG
IPR-RAT LO50:1620 MG/KG
SCU-RAT LO50:1550 MG/KG
IWN-RAT LO50:1140 MG/KG
DRL-MUS LO50:1600 MG/KG
IPR-MUS LO50:1140 MG/KG
SCU-MUS LO50:1360 MG/KG
IWN-MUS LO50:1250 MG/KG

AGACOH 4,125,74
OYYAA2 7,1251,73
OYYAA2 7,1251,73
JACTDZ 12,113,93
ARTDO 41,79,78
OYYAA2 7,1251,73
OYYAA2 7,1251,73
YKKZAJ 89,1138,69

TARGET ORGAN DATA
BEHAVIORAL (SOMNOLENCE)
LUNGS, THORAX OR RESPIRATION (DYSPNEA)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY DEPRESSION)
KIDNEY, URETER, BLADDER (OTHER CHANGES IN URINE COMPOSITION)
EFFECTS ON FERTILITY (LITTER SIZE)
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
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A
CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. TRANSPORT INFORMATION
CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. REGULATORY INFORMATION
EUROPEAN INFORMATION
HARMFUL
HARMFUL IF SWALLOWED.

CONTINUED ON NEXT PAGE
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CATALOG #: C7755

NAME: L-CYSTEINE FREE BASE CRYSTALLINE

R 36/37/38
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

S 26
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLenty OF WATER AND SEEK MEDICAL ADVICE.

S 36
WEAR SUITABLE PROTECTIVE CLOTHING.

REVIEWS, STANDARDS, AND REGULATIONS

QEL=MAK

DEL-RUSSIA: STEL 2 MG/M3 JAN93

NOES 1983: HZD X4773; NIE 2; TNE 81; NDS 7; TNE 8402; TFE 7734

EPA GENETOX PROGRAM 1988, INCONCLUSIVE: HISTIDINE REVERSION-AMES TEST

EPA TSQA SECTION 8(B) CHEMICAL INVENTORY

EPA TSQA TEST SUBMISSION (TSQATS) DATA BASE, OCTOBER 1995

SECTION 16. OTHER INFORMATION

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