



**SIGMA-ALDRICH**

SIGMA CHEMICAL COMPANY  
POST OFFICE BOX 14508  
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DATE 01/21/99  
CUST#: 0-495-04629  
PO#: 1235

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

THIS MSDS IS FOR A COMPONENT OF CATALOG #: P2069

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #: P4161  
NAME: PHENOL ACS REAGENT

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #: 108-95-2  
MF: C6H6O  
EC NO: 203-632-7

SYNONYMS

ACIDE CARBOLIQUE (FRENCH) \* BAKER'S P AND S LIQUID AND OINTMENT \*  
BENZENOL \* CARBOLIC ACID \* CARBOLSAURE (GERMAN) \* FENOL (DUTCH,  
POLISH) \* FENOLO (ITALIAN) \* HYDROXYBENZENE \* MONOHYDROXYBENZENE \*  
MONOPHENOL \* NCI-C50124 \* OXYBENZENE \* PHENIC ACID \* PHENOL (ACGIH:  
OSHA) \* PHENOL ALCOHOL \* PHENOLE (GERMAN) \* PHENYL HYDRATE \* PHENYL  
HYDROXIDE \* PHENYLIC ACID \* PHENYLIC ALCOHOL \* RCRA WASTE NUMBER U188  
\*

SECTION 3. HAZARDS IDENTIFICATION

LABEL PRECAUTIONARY STATEMENTS

HIGHLY TOXIC (USA)  
TOXIC (EU)  
TOXIC BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.  
CAUSES BURNS.  
VESICANT.  
READILY ABSORBED THROUGH SKIN.  
COMBUSTIBLE.  
TARGET ORGAN(S):  
CENTRAL NERVOUS SYSTEM  
KIDNEYS  
UNPLEASANT ODOR.  
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE  
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).  
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF  
WATER AND SEEK MEDICAL ADVICE.  
TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING.  
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE  
PROTECTION.

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

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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.  
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.  
COMBUSTIBLE.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS

EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

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

EVACUATE AREA.  
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY  
RUBBER GLOVES.  
COVER WITH DRY LIME OR SODA ASH, PICK UP, KEEP IN A CLOSED CONTAINER  
AND HOLD FOR WASTE DISPOSAL.  
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.  
USE ONLY IN A CHEMICAL FUME HOOD.  
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.  
KEEP TIGHTLY CLOSED.  
KEEP AWAY FROM HEAT AND OPEN FLAME.

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

APPEARANCE AND ODOR  
SOLID.

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PHYSICAL PROPERTIES

BOILING POINT: 182 C  
MELTING POINT: 40 C TO 42 C  
FLASHPOINT: 175F  
79.44C

EXPLOSION LIMITS IN AIR:

UPPER 8.6%  
LOWER 1.7%  
AUTOIGNITION TEMPERATURE: 1319 F 714C  
VAPOR PRESSURE: 0.36MM 20 C  
SPECIFIC GRAVITY: 1.071  
VAPOR DENSITY: 3.24

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

STABILITY  
STABLE.

INCOMPATIBILITIES

STRONG OXIDIZING AGENTS  
STRONG BASES  
STRONG ACIDS  
MAY DISCOLOR ON EXPOSURE TO LIGHT.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

TOXIC FUMES OF:  
CARBON MONOXIDE, CARBON DIOXIDE

HAZARDOUS POLYMERIZATION  
WILL NOT OCCUR.

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

ACUTE EFFECTS

HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.  
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  
VOMITING.  
EXPOSURE CAN CAUSE:  
DERMATITIS  
MAY CAUSE NERVOUS SYSTEM DISTURBANCES.  
INGESTION CAN CAUSE CIRCULATORY COLLAPSE, TACHYPNEA, PARALYSIS,  
CONVULSIONS, COMA, NECROSIS OF MOUTH AND G.I. TRACT, JAUNDICE, DEATH  
FROM RESPIRATORY FAILURE, SOMETIMES FROM CARDIAC ARREST.  
READILY ABSORBED THROUGH SKIN.

CHRONIC EFFECTS

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TARGET ORGAN(S):  
CENTRAL NERVOUS SYSTEM  
KIDNEYS  
LIVER  
PANCREAS  
SPLEEN

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

RTECS #: SJ3325000  
PHENOL

IRRITATION DATA

SKN-RBT 500 MG/24H SEV	BIOFX*	27-4/1973
SKN-RBT 535 MG OPEN SEV	UCDS**	1/6/1966
SKN-RBT 100 MG MLD	KSGZA3	33 518 1980
EYE-RBT 5 MG SEV	UCDS**	1/6/1966
EYE-RBT 5 MG/30S RINSE MLD	TXCYAC	23,281,1982

TOXICITY DATA

ORL-INF LDLO:10 MG/KG	34ZIAG	- ,463,1969
ORL-HMN LDLO:14 GM/KG	34ZIAG	- ,463,1969
ORL-HMN LDLO:140 MG/KG	29ZWAE	- ,329,1968
ORL-RAT LD50:317 MG/KG	PSEBAA	32 592 1935
IHL-RAT LC50:316 MG/M3	GISAAA	41(6),103,1976
SKN-RAT LD50:669 MG/KG	BJIMAG	27,155,1970
IPR-RAT LD50:127 MG/KG	FCTOD7	22,665,1984
SCU-RAT LD50:460 MG/KG	TOIZAG	10,1,1963
ORL-MUS LD50:270 MG/KG	GISAAA	38(8),6,1973
IHL-MUS LC50:177 MG/M3	GISAAA	41(6),103,1976
IPR-MUS LD50:180 MG/KG	PHMCAA	10,172,1968
SCU-MUS LD50:344 MG/KG	INHEAO	5,143,1967
IVN-MUS LD50:112 MG/KG	OJPPAL	12,212,1939
SKN-RBT LD50:630 MG/KG	UCDS**	1/6/1966
ORL-MAM LD50:500 MG/KG	GTPZAB	32(10),25,1988

TARGET ORGAN DATA

PERIPHERAL NERVE AND SENSATION (SPASTIC PARALYSIS WITH/WITHOUT SENSORY CH  
BEHAVIORAL (HALLUCINATIONS, DISTORTED PERCEPTIONS)  
BEHAVIORAL (TREMOR)  
BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)  
BEHAVIORAL (MUSCLE WEAKNESS)  
CARDIAC (OTHER CHANGES)  
LUNGS, THORAX OR RESPIRATION (CYANOSIS)  
KIDNEY, URETER, BLADDER (HEMATURIA)  
SKIN AND APPENDAGES (AFTER TOPICAL APPLICATION: CUTANEOUS SENSITIZATION)  
SKIN AND APPENDAGES (SWEATING)  
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)  
EFFECTS ON EMBRYO OR FETUS (FETOTOXICITY)  
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES  
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR  
COMPLETE INFORMATION.

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SECTION 12. ----- ECOLOGICAL INFORMATION -----
DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----
THIS COMBUSTIBLE MATERIAL MAY BE BURNED 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

EC INDEX NO: 604-001-00-2
TOXIC
R 24/25
TOXIC IN CONTACT WITH SKIN AND IF SWALLOWED.
R 34
CAUSES BURNS.
S 28
AFTER CONTACT WITH SKIN, WASH IMMEDIATELY WITH PLENTY OF WATER.
S 45
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK
ACGIH TLV-NOT CLASSIFIABLE AS A HUMAN CARCINOGEN DTLVS\* TLV/BEI,1997
ACGIH TLV-TWA 19 MG/M3 (5 PPM) (SKIN) DTLVS\* TLV/BEI,1997
IARC CANCER REVIEW:ANIMAL INADEQUATE EVIDENCE IMEMDT 47,263,1989
IARC CANCER REVIEW:HUMAN INADEQUATE EVIDENCE IMEMDT 47,263,1989
IARC CANCER REVIEW:GROUP 3 IMEMDT 47,263,1989
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
FEREAC 54,7740,1989
MSHA STANDARD-AIR:TWA 5 PPM (19 MG/M3) (SKIN)
DTLVS\* 3,203,1971
OSHA PEL (GEN'INDU):8H TWA 5 PPM (19 MG/M3) (SKIN)
CFRGBR 29,1910.1000,1994
OSHA PEL (CONSTRUC):8H TWA 5 PPM (19 MG/M3) (SKIN)
CFRGBR 29,1926.55,1994
OSHA PEL (SHIPYARD):8H TWA 5 PPM (19 MG/M3) (SKIN)
CFRGBR 29,1915.1000,1993
OSHA PEL (FED CONT):8H TWA 5 PPM (19 MG/M3) (SKIN)
CFRGBR 41,50-204.50,1994
OEL-ARAB REPUBLIC OF EGYPT:TWA 5 PPM (19 MG/M3);SKIN JAN 1993
OEL-AUSTRALIA:TWA 5 PPM (19 MG/M3);SKIN JAN 1993

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OEL-BELGIUM:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-DENMARK:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-FINLAND:TWA 5 PPM (19 MG/M3);STEL 10 PPM (38 MG/M3);SKIN JAN 1993  
OEL-FRANCE:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-GERMANY:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-HUNGARY:TWA 4 MG/M3;STEL 8 MG/M3;SKIN JAN 1993  
OEL-JAPAN:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-THE NETHERLANDS:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-THE PHILIPPINES:TWA 5 PPM (10 MG/M3);SKIN JAN 1993  
OEL-POLAND:TWA 10 PPM JAN 1993  
OEL-RUSSIA:TWA 5 PPM;STEL 0.3 MG/M3;SKIN JAN 1993  
OEL-SWEDEN:TWA 1 PPM (4 MG/M3);STEL 2 PPM (8 MG/M3);SKIN JAN 1993  
OEL-SWITZERLAND:TWA 5 PPM (19 MG/M3);STEL 10 PPM (38 MG/M3);SKIN JAN 1993  
OEL-THAILAND:TWA 5 PPM (19 MG/M3) JAN 1993  
OEL-TURKEY:TWA 5 PPM (19 MG/M3);SKIN JAN 1993  
OEL-UNITED KINGDOM:TWA 5 PPM (19 MG/M3);STEL 10 PPM;SKIN JAN 1993  
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV  
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV  
NIOSH REL TO PHENOL-AIR:10H TWA 5 PPM (SK);CL 15.6 PPM/15M (SK)  
NIOSH\* DHHS #92-100,1992  
NOHS 1974: HZD 55460; NIS 185; TNF 23275; NOS 127; TNE 296662  
NOES 1983: HZD 55460; NIS 229; TNF 31983; NOS 155; TNE 584372; TFE 120977  
ATSDR TOXICOLOGY PROFILE (NTIS\*\* PB/90/181249/AS)  
EPA GENETOX PROGRAM 1988, NEGATIVE: N CRASSA-REVERSION  
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY  
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES  
ON EPA IRIS DATABASE  
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JUNE 1998  
NIOSH ANALYTICAL METHOD, 1994: CRESOL (ALL ISOMERS) AND PHENOL, 2546  
NIOSH ANALYTICAL METHOD, 1994: PHENOL, 3502; IN URINE, 8305  
NCI CARCINOGENESIS BIOASSAY (ORAL);NO EVIDENCE:MOUSE,RAT  
NCITR\* NCI-TR-203,80  
OSHA ANALYTICAL METHOD #32

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. 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.

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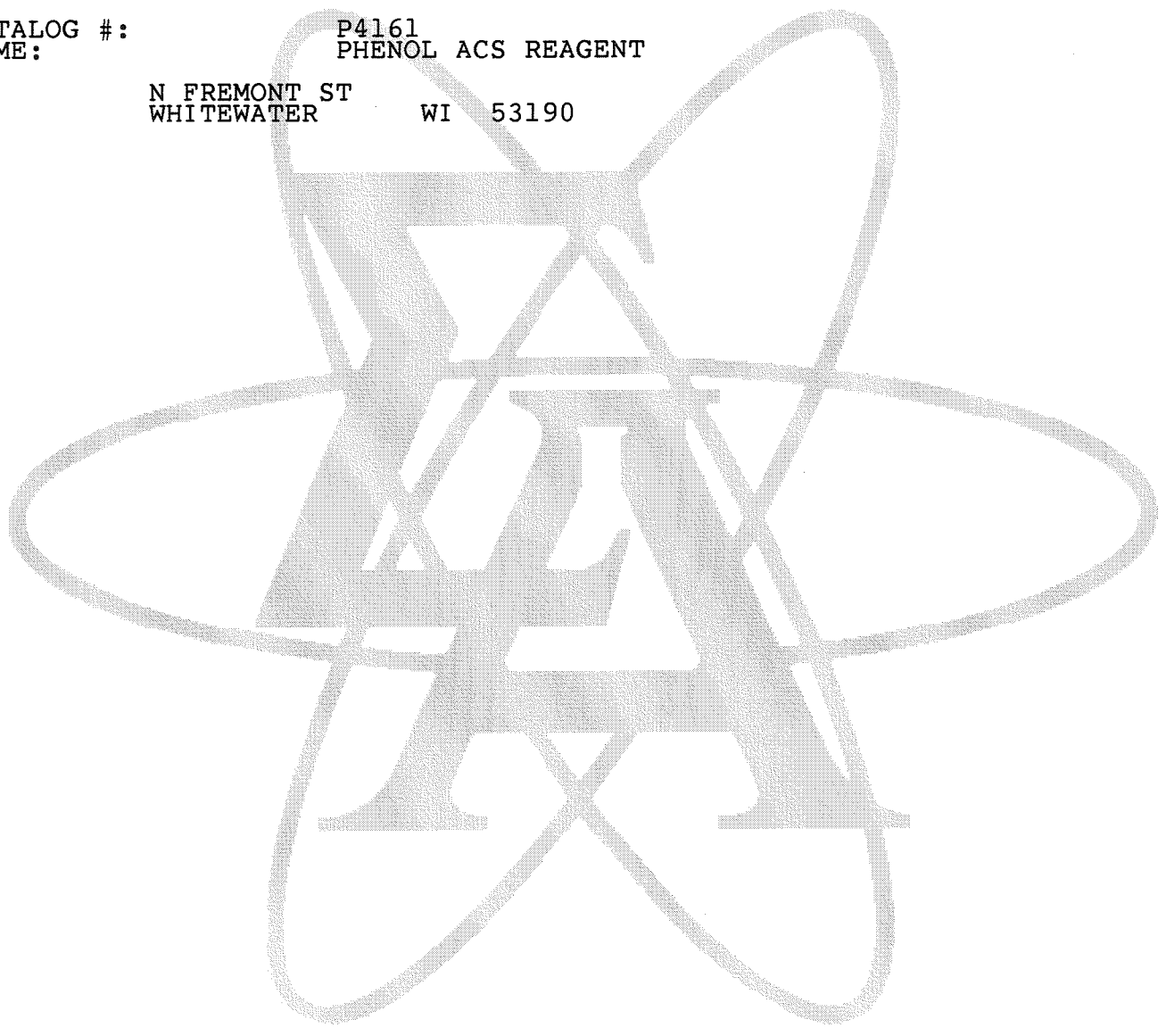
M A T E R I A L   S A F E T Y   D A T A   S H E E T                      P A G E   7

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CATALOG #:  
NAME:

P4161  
PHENOL ACS REAGENT

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