



SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

NAME USED ON LABEL: KANEKA KANE ACE MX-136
PRODUCT USE: INDUSTRIAL USE
SUPPLIER/MANUFACTURER: KANEKA TEXAS CORPORATION
ADDRESS: 6161 UNDERWOOD RD
PASADENA, TEXAS 77507
EMERGENCY PHONE: CHEMTREC 800-424-9300 or 703-527-3887
TECHNICAL INFORMATION: 281-291-4421
TRADE NAMES/SYNONYMS: MIXTURE OF POLYMERS

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT	CAS	EINECS	PERCENTAGE
BUTADIENE-ACRYLIC COPOLYMER	PROPRIETARY	PROPRIETARY	5-35%
BISPHENOL-F & EPICHLOROHYDRIN BASED EPOXY RESIN	28064-14-4	N/A	65-95%

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=0



EMERGENCY OVERVIEW:

COLOR: yellow to opaque

PHYSICAL FORM: liquid to semi-solid

MAJOR HEALTH HAZARDS: respiratory tract irritation, skin irritation, eye irritation, allergic reaction, sensitization

PHYSICAL HAZARDS: Slight fire hazard

POTENTIAL HEALTH EFFECTS:

INHALATION:

Short term exposure: irritation

Long term exposure: same as effects reported in short term exposure

SKIN CONTACT:

Short term exposure: irritation, dermatitis, allergic reaction, sensitization

Long term exposure: same as effects reported in short term exposure

EYE CONTACT:

Short term exposure: irritation

Long term exposure: same as effects reported in short term exposure

INGESTION:

Short term exposure: no data available.

Long term exposure: no data available.

CARCINOGEN STATUS:

OSHA: No

NTP: No

IARC: No

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Administer oxygen if breathing is difficult. Call 911 or emergency medical services.

SKIN CONTACT: Wash skin with soap and water for at least 20 minutes. Remove and isolate contaminated clothing and shoes. Call 911 or emergency medical services.

EYE CONTACT: Flush eyes with plenty of water for at least 20 minutes. Call 911 or emergency medical services.

INGESTION: If a large amount is swallowed, Call 911 or emergency medical services.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Slight fire hazard.

EXTINGUISHING MEDIA: dry chemical, carbon dioxide, water spray, regular foam

FIRE FIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FLASH POINT: Not determined
LOWER FLAMMABLE LIMIT: Not determined
UPPER FLAMMABLE LIMIT: Not determined
AUTOIGNITION: Not determined
FLAMMABILITY CLASS (OSHA): IIIB

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Small spills: Stop leak if possible without personal risk. Absorb with sand or other non-combustible material and place material into appropriate containers for later disposal.

Large spills: Dike far ahead of liquid spill for later disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Store in a tightly closed container. Store in a well ventilated area. Protect from direct sunlight. Material should be stored in appropriate secondary containers or in a diked area. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Keep separated from incompatible substances.

HANDLING: Empty containers may contain residual liquid; therefore, empty containers should be handled with care.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR									
		ACGIH-TLVs		OSHA-PELs		NIOSH-RELs		NIOSH	AIHA WEELs		OTHER
		TWA	STEL	TWA	STEL	TWA	STEL	IDLH	TWA	STEL	
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
May contain trace amounts of the following, as a result of out-gassing or residual monomers :											
1,3-Butadiene	106-99-0	2	NE	1	5	LFC (LOQ 0.19)	LFC (LOQ 0.19)	NE	NE	NE	DFG MAKs: Carcinogen EPA-B2; EPA-CaH; IARC-2A; MAK-1; NIOSH-Ca; NTP-K; TLV-A2

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Trade secret acrylic monomer	Trade secret	NE	NE	NE	NE	NE	NE	NE	0.1 mg/m ³	NE	AIHA WEELS: May cause dermal sensitization (aerosol only)
Methyl Methacrylate	80-62-6	50 (sen)	100 (sen)	100	NE	100	NE	1000	NE	NE	DFG MAKs: TWA=50 (skin) PEAK=2•MAK, 15 min. average value, 1-hr interval; DFG MAK Pregnancy Risk Class: C; Carcinogen: EPA-E, EPA-NL, IARC-3, TLV-A4
Styrene	100-42-5	20	40	100 50 (vacated 1989 PEL)	200 (ceiling); 600 (5 min. peak in any 3 hrs) 100 (vacated 1989 PEL)	10	100	700	NE	NE	DFG MAKs: TWA = 20 PEAK = 2•MAK, 15 min. average value, 1-hr interval DFG MAK Pregnancy Risk Class: C Carcinogen: IARC-2B, MAK-5, TLV-A4
Trade secret acrylic monomer	Trade secret	2 (skin)	NE	2 (skin)	C10	1 (skin)	C10-15 minutes (skin)	85	NE	NE	EPA-B1; IARC 2B; MAK-2; NIOSH-Ca; NTP-R; OSHA-Ca; TLV-A3
Reaction product of Epichlorohydrin based Epoxy Resin & Bisphenol F	25085-99-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
These products consist of one of the following related polymers: Exposure limits are for Particulates, not Otherwise Classified (PNOC)											
Trade Secret Acrylic Polymers Exposure limits are for Particulates, not Otherwise Classified (PNOC)	Trade Secret	NE	NE	50 mppcf or 15 (total dust) 15 mppcf or 5 (respirable fraction)		NE	NE	NE	NE	NE	DFG MAK: TWA = 4 (inhalable fraction); 1.5 (respirable fraction) general dusts

VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety glasses with side-shields. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

PROTECTIVE MATERIAL TYPES: Not determined

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Consider warning properties before use. The following respirators are drawn from NIOSH and/or OSHA.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:

Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor and acid gas canister/Any appropriate escape-type, self-contained breathing apparatus

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid to semi-solid

COLOR: yellow to opaque

ODOR: epoxy odor

BOILING POINT: Not available

MELTING POINT: Not available

VAPOR PRESSURE: Not available

RELATIVE DENSITY (water=1): 1.1-1.2

WATER SOLUBILITY: Negligible

PH: Not available

PERCENT VOLATILES: Not available

ODOR THRESHOLD: Not available

EVAPORATION RATE (n-BuAc=1): Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

EXPANSION RATIO: Not applicable

VISCOSITY: Not available

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials. Temperatures above 300F (150C) may cause oxidative decomposition and polymerization.

INCOMPATIBILITIES: oxidizing materials, acids, amines, bases strong caustics, water

HAZARDOUS DECOMPOSITION:

Thermal decomposition (combustion) products: oxides of carbon, phenolics, various polymer compounds, hydrocarbons

POLYMERIZATION: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

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TOXICITY DATA:

1,3-BUTADIENE:

ACUTE TOXICITY AND IRRITATION DATA

Inhalation human lowest published toxic concentration: 2,000 ppm/7 hour Eye: Other eye effects Behavioral: Hallucinations, distorted perceptions **inhalation human** lowest published toxic concentration: 8,000 ppm Eye: Visual field changes Eye: Conjunctiva irritation Lung, Thorax, or Respiration: Cough **inhalation human** lowest published toxic concentration: 1 pph/5 minute Cardiac: Pulse rate decreased with fall in BP Gastrointestinal: Changes in structure or function of salivary glands **inhalation mouse** lethal concentration (50 percent kill): 270,000 mg/m³/2 hour N/R **Inhalation mouse** lethal concentration (16 percent kill): 203,000 mg/m³/2 hour N/R **Inhalation mouse** lethal concentration (84 percent kill): 375,000 mg/m³/2 hour N/R **inhalation mouse** lowest published toxic concentration: 62.5 ppm/6 hour Kidney, Ureter, and Bladder: Other changes in urine composition Blood: Changes in serum composition (e.g. TP, bilirubin, cholesterol) **inhalation rat** lethal concentration (50 percent kill): 285 gm/m³/4 hour Behavioral: General anesthetic Lung, Thorax, or Respiration: Respiratory depression **inhalation rat** lethal concentration (50 percent kill): 285,000 mg/m³/4 hour N/R **inhalation rat** lethal concentration (16 percent kill): 175,000 mg/m³/4 hour N/R **inhalation rat** lethal concentration (84 percent kill): 460,000 mg/m³/4 hour N/R **inhalation rat** lowest published toxic concentration: 62.5 ppm/6 hour Kidney, Ureter, and Bladder: Other changes in urine composition Blood: Changes in serum composition (e.g. TP, bilirubin, cholesterol) **inhalation rabbit** lowest published lethal concentration: 25 pph/23 minute Eye: Mydriasis (pupillary dilation) Behavioral: Tremor Behavioral: Muscle weakness **inhalation rabbit** lowest published lethal concentration: 250,000 ppm N/R **inhalation rabbit** lowest published toxic concentration: 200,000 mg/m³/2 hour Blood: Changes in leukocyte (WBC) count **oral mouse** lethal dose (50 percent kill): 3,210 mg/kg N/R **oral rat** lethal dose (50 percent kill): 5,480 mg/kg N/R

TUMORIGENIC DATA

Inhalation mouse lowest published toxic concentration: 625 ppm/6 hour/13 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Olfaction: Tumors Cardiac: Tumors **inhalation mouse** toxic concentration (other than lowest) : 200 ppm/40 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Gastrointestinal: Tumors **inhalation mouse** toxic concentration (other than lowest) : 625 ppm/6 hour/65 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Eye: Tumors Cardiac: Tumors **inhalation mouse** toxic concentration (other than lowest) : 63 ppm/6 hour/2 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Vascular: Tumors Liver: Tumors **inhalation mouse** toxic concentration (other than lowest) : 200 ppm/6 hour/1 year- intermittent Tumorigenic: Neoplastic by RTECS criteria Gastrointestinal: Tumors Tumorigenic: Increased incidence of tumors in susceptible strains **inhalation mouse** lowest published toxic concentration: 20 ppm/6 hour/1 year- intermittent Tumorigenic: Neoplastic by RTECS criteria Gastrointestinal: Tumors Tumorigenic: Increased incidence of tumors in susceptible strains **inhalation mouse** toxic concentration (other than lowest) : 216 mg/kg/8 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Lung, Thorax, or Respiration: Other changes **inhalation mouse** lowest published toxic concentration: 22,500 mg/kg/60 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Cardiac: Tumors Lung, Thorax, or Respiration: Tumors **inhalation mouse** lowest published toxic concentration: 22,875 mg/kg/61 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Cardiac: Tumors Lung, Thorax, or Respiration: Tumors **inhalation mouse** lowest published toxic concentration: 45,750 mg/kg/61 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Liver: Tumors Skin and Appendages: Tumors **inhalation mouse** lowest published toxic concentration: 1,730.4 mg/kg/103 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Liver: Tumors Blood: Lymphoma including Hodgkin's disease **inhalation mouse** lowest published toxic concentration: 540.75 mg/kg/103 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Liver: Tumors Blood: Lymphoma including Hodgkin's disease **inhalation rat** lowest published toxic concentration: 625 ppm/6 hour/61 week Tumorigenic: Carcinogenic by RTECS criteria Cardiac: Tumors Lung, Thorax, or Respiration: Tumors **inhalation rat** toxic concentration (other than lowest) : 1,000 ppm/6 hour/2 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Skin and Appendages: Tumors **inhalation rat** toxic concentration (other than lowest) : 8,000 ppm/6 hour/2 year- intermittent Tumorigenic: Neoplastic by RTECS criteria Gastrointestinal: Tumors Endocrine: Thyroid tumors **Inhalation rat** toxic concentration (other than lowest) : 8,000 ppm/6 hour/15 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Endocrine: Tumors **inhalation rat** toxic concentration (other than lowest) : 8,000 ppm/6 hour/2 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Endocrine: Thyroid tumors Skin and Appendages: Tumors

MUTATION DATA:

cytogenetic analysis human lymphocyte 300 µmol/L **cytogenetic analysis** oral mouse 18 gm/kg/30 day- continuous **cytogenetic cytogenetic analysis** inhalation mouse 625 ppm/6 hour/10 day- intermittent **cytogenetic analysis** inhalation mouse 1,250 ppm/5 day/2 week- intermittent **cytogenetic analysis** inhalation rat 1,250 ppm/5 day/2 week- intermittent **dominant lethal test** inhalation mouse

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1,250 ppm/6 hour/10 week- intermittent **DNA adduct** inhalation mouse 200 ppm/5 day/6 hour- continuous **DNA adduct** inhalation mouse 20 ppm/6 hour **DNA adduct** inhalation mouse 1 ppm/5 day **DNA adduct** inhalation mouse 21 mg/kg/6 hour **DNA adduct** inhalation rat 20 ppm/6 hour **DNA adduct** inhalation rat 1 ppm/5 day **DNA adduct** inhalation rat 10 mg/kg/6 hour **DNA damage** inhalation mouse 125 ppm/6 hour- continuous **DNA damage** inhalation mouse 20 ppm/1 year- intermittent **DNA damage** inhalation mouse 1,250 ppm/2 week- intermittent **DNA damage** inhalation rat 1,250 ppm/2 week- intermittent **mutation in microorganisms** Salmonella typhimurium 20 pph/20 hour- continuous (+enzymatic activation step) **mutation in microorganisms** Salmonella typhimurium 2 pph (-enzymatic activation step) **micronucleus test** inhalation mouse 6,250 ppb/6 hour/13 week- intermittent **micronucleus test** inhalation mouse 500 ppm/5 day **mutation in mammalian somatic cells** mouse lymphocyte 20 pph **mutation in mammalian somatic cells** inhalation mouse 625 ppm/6 hour/2 week- intermittent **sister chromatid exchange** hamster ovary 25 µmol/L **sister chromatid exchange** human lymphocyte 500 µmol/L **sister chromatid exchange** inhalation mouse 6,250 ppb/6 hour/10 day- intermittent **specific locus test** inhalation mouse 500 ppm/6 hour/5 day- continuous **specific locus test** inhalation mouse 3 ppm/14 day- intermittent **specific locus test** inhalation mouse 1,250 ppm/2 week- intermittent **specific locus test** inhalation rat 1,250 ppm/2 week- intermittent **sperm morphology** inhalation mouse 130 ppm/5 day/6 hour- continuous **heritable translocation test** inhalation mouse 500 ppm/6 hour/5 day

REPRODUCTIVE DATA:

Inhalation mouse lowest published toxic concentration: 500 ppm/6 hour (5 day male) Reproductive: Paternal effects: Testes, epididymis, sperm duct Reproductive: Effects on embryo or fetus: Cytological changes (including somatic cell genetic material) **inhalation mouse** lowest published toxic concentration: 1,000 ppm/6 hour (6-15 day pregnant) Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants) Reproductive: Effects on embryo or fetus: Extra embryonic structures (e.g., placenta, umbilical cord) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) **inhalation mouse** lowest published toxic concentration: 1,000 ppm/6 hour (6-15 day pregnant) Reproductive: Maternal effects: Uterus, cervix, vagina **inhalation rat** lowest published toxic concentration: 8,000 ppm/6 hour (6-15 day pregnant) Reproductive: Specific developmental abnormalities: Musculoskeletal system

RTECS Compound Description:

Tumorigen
Mutagen
Reproductive Effector
Human Data

STYRENE:

ACUTE TOXICITY AND IRRITATION DATA

Eye rabbit 100 mg severe; **eye rabbit** 100 mg/24 hour moderate; **skin human** 500 mg rinse moderate; **skin rabbit** 500 mg open irritation test mild; **skin rabbit** 1,00% moderate

ACUTE TOXICITY

Inhalation guinea pig lowest published lethal concentration: 12 gm/m³/14 hour Eye: Lacrimation Behavioral: Muscle weakness Behavioral: Antipsychotic; **inhalation human** lowest published lethal concentration: 10,000 ppm/30 minute N/R; **inhalation human** lowest published toxic concentration: 600 ppm Olfaction: Other olfaction effects Eye: Other eye effects ; **inhalation human** lowest published toxic concentration: 20 µg/m³ Eye: Other eye effects; **inhalation human** lowest published toxic concentration: 376 ppm/1 hour Peripheral Nerve and Sensation: Flaccid paralysis without anesthesia (usually neuromuscular blockage) Behavioral: Change in motor activity (specific assay); **inhalation human** lowest published toxic concentration: 100 ppm/1 hour Eye: Conjunctiva irritation; **inhalation human** lowest published toxic concentration: 376 ppm/25 minute Behavioral: Change in psychophysiological tests ; **inhalation human** lowest published toxic concentration: 376 ppm/50 minute Gastrointestinal: Nausea or vomiting Behavioral: Ataxia; **inhalation human** lowest published toxic concentration: 376 ppm/60 minute Behavioral: Headache; **inhalation human** lowest published toxic concentration: 800 ppm/4 hour Behavioral: Somnolence (general depressed activity) Behavioral: Muscle weakness Behavioral: Ataxia; **Inhalation man** lowest published toxic concentration: 50 mg/m³/8 hour Kidney, Ureter, and Bladder: Other changes in urine composition; **inhalation mouse** lowest published toxic concentration: 300 ppm/6 minute Lung, Thorax, or Respiration: Respiratory depression; **inhalation mouse** lethal concentration (50 percent kill): 21,000 mg/m³/2 hour N/R; **inhalation mouse** lethal concentration (50 percent kill): 9,500 mg/m³/4 hour N/R; **inhalation mouse** lowest published toxic concentration: 40 ppm/6 hour Lung, Thorax, or Respiration: Other changes Blood: Other changes Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: Dehydrogenases; **inhalation rat** lethal concentration (50 percent kill): 11,800 mg/m³/4 hour N/R ; **inhalation rat** lowest published toxic concentration: 5,460 mg/m³/1 hour Eye: Lacrimation Gastrointestinal: Changes in structure or function of salivary glands; **inhalation rat** lowest published toxic concentration: 40,000 mg/m³/2 hour Endocrine: Changes in thymus weight Blood: Changes in serum composition (e.g. TP, bilirubin, cholesterol) Blood: Changes in leukocyte (WBC) count ; **inhalation rat** lowest published toxic concentration: 500 ppm/6 hour Lung, Thorax, or Respiration: Changes in lung weight Gastrointestinal: Changes in structure or function of salivary glands; **inhalation rabbit** lowest published lethal concentration: 4,000 ppm/4 hour N/R; **Inhalation rabbit** lowest published toxic concentration: 40,000 mg/m³/2 hour Endocrine: Changes in thymus weight Blood: Changes in serum composition (e.g. TP, bilirubin, cholesterol) Blood: Changes in leukocyte (WBC) count ; **Intraperitoneal mouse** lethal dose (50 percent kill): 660 mg/kg N/R; **Intraperitoneal mouse** lowest published toxic dose: 600 mg/kg Lung, Thorax, or Respiration: Other changes Blood: Changes in serum composition (e.g. TP, bilirubin, cholesterol) Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: Multiple enzyme effects; **Intraperitoneal rat** lethal dose (50 percent kill): 898 mg/kg N/R; **intravenous mouse** lethal dose (50 percent kill): 90 mg/kg N/R; **oral mammal (species unspecified)** lethal dose (50 percent kill): >1,500 mg/kg N/R; **Oral mouse** lethal dose (50 percent kill): 316 mg/kg N/R; **oral rat** lethal dose (50 percent kill): 2,650 mg/kg Behavioral: Somnolence (general depressed activity) Liver: Other changes **oral rat** lethal dose (50 percent kill): 5,000 mg/kg N/R; **oral rat** lethal dose (10 percent kill): 5 mL/kg N/R

TUMOROGENIC DATA

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Inhalation mouse lowest published toxic concentration: 160 ppm/6 hour/2 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Lung, Thorax, or Respiration: Tumors; **Inhalation mouse** lowest published toxic concentration: 160 ppm/6 hour/98 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Lung, Thorax, or Respiration: Tumors; **Inhalation mouse** lowest published toxic concentration: 20 ppm/6 hour/98 week- intermittent Tumorigenic: Neoplastic by RTECS criteria Lung, Thorax, or Respiration: Tumors; **Inhalation mouse** lowest published toxic concentration: 40 ppm/6 hour/104 week- intermittent Tumorigenic: Neoplastic by RTECS criteria Lung, Thorax, or Respiration: Tumors; **Inhalation rat** lowest published toxic concentration: 100 ppm/4 hour/5 day/1 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Skin and Appendages: Tumors Blood: Leukemia; **Oral rat** lowest published toxic dose: 1,520 mg/kg/43 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Skin and Appendages: Tumors

MUTATION DATA

body fluid assay human lymphocyte 300 mg/kg; **cytogenetic analysis** hamster lung 100 mg/L; **cytogenetic analysis** inhalation human 7,500 ppb/8 hour/5 day- intermittent; **cytogenetic analysis** human lymphocyte 300 ppm/72 hour; **cytogenetic analysis** multiple human 20 ppm/8 year- intermittent; **cytogenetic analysis** inhalation rat 300 ppm/8 week- intermittent; **DNA adduct** inhalation mouse 1,500 mg/m³/21 day- intermittent; **DNA damage** human leukocyte 5 mmol/L/30 minute; **DNA damage** Intraperitoneal mouse 10 mmol/kg; **DNA damage** inhalation mouse 1,500 mg/m³/7 day- intermittent; **DNA damage** rat liver 3 mmol/L; **DNA inhibition** human HeLa cell 28 mmol/L; **unscheduled DNA synthesis** human lymphocyte 100 μmol/L; **unscheduled DNA synthesis** rat liver 3,800 μmol/L; **host-mediated assay** mouse Saccharomyces cerevisiae 1 gm/kg; **host-mediated assay** mouse Schizosaccharomyces pombe 1 gm/kg; **mutation in microorganisms** hamster lung 240 μmol/plate (+enzymatic activation step); **mutation in microorganisms** Salmonella typhimurium 1 μmol/plate (-enzymatic activation step); **mutation in microorganisms** Saccharomyces cerevisiae 1 mmol/L (-enzymatic activation step); **micronucleus test** Intraperitoneal mouse 250 mg/kg; **micronucleus test** inhalation mouse 1,500 mg/m³/7 day- intermittent; **gene conversion and mitotic recombination** Saccharomyces cerevisiae 1 mmol/L; **morphological transform** rat embryo 145 μg/plate; **sister chromatid exchange** Inhalation human 1,204 mg/m³/5 year- intermittent; **sister chromatid exchange** human lymphocyte 10 μmol/L; **sister chromatid exchange** Intraperitoneal mouse 450 mg/kg; **sister chromatid exchange** Inhalation mouse 125 ppm/4 day- intermittent; **sister chromatid exchange** Intraperitoneal rat 750 mg/kg; **sperm morphology** Intraperitoneal mouse 3,500 mg/kg/7 week- intermittent; **sperm morphology** intraperitoneal rat 40 gm/kg/8 week- intermittent

REPRODUCTIVE DATA

Inhalation hamster lowest published toxic concentration: 1,000 ppm/6 hour (6-18 day pregnant) Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants); **inhalation mouse** lowest published toxic concentration: 500 ppm/6 hour (6-16 day pregnant) Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants); **inhalation rat** lowest published toxic concentration: 293 ppm/6 hour (7-21 day pregnant) Reproductive: Effects on newborn: Behavioral; **inhalation rat** lowest published toxic concentration: 1,500 μg/m³/24 hour (1-22 day pregnant) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) Reproductive: Effects on embryo or fetus: Fetal death; **Inhalation rat** lowest published toxic concentration: 5 mg/m³/24 hour (1-22 day pregnant) Reproductive: Effects on newborn: Stillbirth Reproductive: Effects on newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4); **inhalation rat** lowest published toxic concentration: 1,500 μg/m³/24 hour (1-7 day pregnant) Reproductive: Effects on fertility: Pre- implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea) Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants); **inhalation rat** lowest published toxic concentration: 50 ppm/6 hour (7-12 day pregnant) Reproductive: Effects on newborn: Growth statistics (e.g., reduced weight gain); **oral rat** lowest published toxic dose: 8,600 mg/kg (1-22 day pregnant/21 day after birth) Reproductive: Effects on newborn: Behavioral; **oral rat** lowest published toxic dose: 5,575 mg/kg multigenerations) Reproductive: Effects on newborn: Viability index (e.g., # alive at day 4 per # born alive) Reproductive: Effects on newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4); **oral rat** lowest published toxic dose: 4 gm/kg (6-15 day pregnant) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus); **oral rat** lowest published toxic dose: 11,470 mg/kg (6-15 day pregnant) Reproductive: Specific developmental abnormalities: Urogenital system

CARCINOGEN STATUS:

(ACGIH) Not classifiable as a human carcinogen (IARC) **Cancer Review** Animal Limited Evidence (IARC) **Cancer Review** Animal Limited Evidence (IARC) **Cancer Review** Animal Limited Evidence (IARC) **Cancer Review** Human Inadequate Evidence (IARC) **Cancer Review** Human Inadequate Evidence (IARC) **Cancer Review** Human Limited Evidence (IARC) **Cancer Review** Group 2B (IARC) **Cancer Review** Group 2B

RTECS Compound Description:

Tumorigen
Mutagen
Reproductive Effector
Human Data
Primary Irritant

ACRYLONITRILE:

ACUTE TOXICITY AND IRRITATION DATA

Eye rabbit 100 mg moderate; **skin human** 500 mg rinse moderate; **skin rabbit** 500 mg severe;

ACUTE TOXICITY

Inhalation cat lowest published lethal concentration: 600 ppm/4 hour Behavioral: Convulsions or effect on seizure threshold Lung, Thorax, or Respiration: Dyspnea Gastrointestinal: Nausea or vomiting **Inhalation dog** lowest published lethal concentration: 110 ppm/4 hour Peripheral Nerve and Sensation: Flaccid paralysis without anesthesia (usually neuromuscular blockage) Behavioral: Convulsions or effect on seizure threshold Behavioral: Coma **inhalation guinea pig** lowest published lethal concentration: 575 ppm/4 hour Eye: Lacrimation Lung, Thorax, or Respiration: Acute pulmonary edema Lung, Thorax, or Respiration: Cough **inhalation human** lowest published toxic concentration: 16 ppm/20 minute Olfaction: Other olfaction effects Eye: Conjunctiva irritation Lung, Thorax, or Respiration: Other changes **inhalation man** lowest published lethal concentration: 1 gm/m³/1 hour

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Behavioral: Somnolence (general depressed activity) Gastrointestinal: Hypermotility, diarrhea Gastrointestinal: Nausea or vomiting
inhalation monkey lethal concentration : >90 ppm/4 hour N/R **inhalation rat** lethal concentration (50 percent kill): 333 ppm/4
hour Eye: Lacrimation Behavioral: Tremor Lung, Thorax, or Respiration: Dyspnea **inhalation rat** lowest published toxic
concentration: 350 mg/m³/6 hour Liver: Other changes Endocrine: Hyperglycemia Biochemical: Metabolism (intermediary): Other
inhalation rat lethal concentration (50 percent kill): 333 ppm/4 hour Behavioral: Tremor Behavioral: Convulsions or effect on
seizure threshold Lung, Thorax, or Respiration: Dyspnea **inhalation rat** lethal concentration (50 percent kill): 946 ppm/4 hour N/R
Inhalation rabbit lowest published lethal concentration: 260 ppm/4 hour Behavioral: Convulsions or effect on seizure threshold
Behavioral: Coma Lung, Thorax, or Respiration: Dyspnea **Intraperitoneal mouse** lethal dose (50 percent kill): 46 mg/kg Eye:
Corneal damage Behavioral: Ataxia Lung, Thorax, or Respiration: Dyspnea **Intraperitoneal rat** lethal dose (50 percent kill): 65
mg/kg N/R **intravenous dog** lowest published lethal dose: 200 mg/kg Behavioral: Convulsions or effect on seizure threshold
Gastrointestinal: Nausea or vomiting Lung, Thorax, or Respiration: Respiratory depression **intravenous rabbit** lethal dose (50
percent kill): 69 mg/kg Peripheral Nerve and Sensation: Flaccid paralysis with appropriate anesthesia Behavioral: Tremor
Behavioral: Convulsions or effect on seizure threshold **Oral guinea pig** lethal dose (50 percent kill): 50 mg/kg N/R **oral mouse**
lethal dose (50 percent kill): 27 mg/kg Behavioral: Convulsions or effect on seizure threshold Lung, Thorax, or Respiration:
Dyspnea Gastrointestinal: Changes in structure or function of salivary glands **oral mouse** lowest published toxic dose: 2.5 mg/kg
Blood: Other changes **oral rat** lethal dose (50 percent kill): 78 mg/kg Behavioral: Convulsions or effect on seizure threshold Lung,
Thorax, or Respiration: Dyspnea Gastrointestinal: Changes in structure or function of salivary glands **subcutaneous guinea pig**
lethal dose (50 percent kill): 130 mg/kg Peripheral Nerve and Sensation: Flaccid paralysis with appropriate anesthesia Behavioral:
Tremor Behavioral: Convulsions or effect on seizure threshold **subcutaneous mouse** lethal dose (50 percent kill): 25 mg/kg Eye:
Other eye effects Behavioral: Change in motor activity (specific assay) Gastrointestinal: Hypermotility, diarrhea **subcutaneous**
mouse lethal dose (50 percent kill): 36 mg/kg N/R **subcutaneous mouse** lowest published toxic dose: 18 mg/kg Immunological
Including Allergic: Decreased immune response **subcutaneous rat** lethal dose (50 percent kill): 75 mg/kg Peripheral Nerve and
Sensation: Spastic paralysis with/without sensory change Behavioral: Convulsions or effect on seizure threshold Lung, Thorax, or
Respiration: Cyanosis **Subcutaneous rat** lethal dose (50 percent kill): 75 mg/kg N/R **subcutaneous rat** lowest published toxic
dose: 37.5 mg/kg Immunological Including Allergic: Decrease in cellular immune response Immunological Including Allergic:
Decrease in humoral immune response **skin child** lowest published lethal dose: 2,015 mg/kg Behavioral: General anesthetic Lung,
Thorax, or Respiration: Cyanosis Gastrointestinal: Nausea or vomiting **skin guinea pig** lethal dose (50 percent kill): 202 mg/kg
N/R **Skin rat** lethal dose (50 percent kill): 148 mg/kg N/R **skin rabbit** lethal dose (50 percent kill): 63 mg/kg Behavioral:
Somnolence (general depressed activity) Skin: After systemic exposure: Dermatitis, other **unreported route rat** lowest published
lethal dose: 200 mg/kg Endocrine: Other changes **unreported route rat** lethal dose : 115 mg/kg Liver: Other changes Biochemical:
Metabolism (intermediary): Other proteins

TUMORIGENIC DATA

Inhalation rat lowest published toxic concentration: 5 ppm/52 week- intermittent Tumorigenic: Equivocal tumorigenic agent by
RTECS criteria Skin and Appendages: Tumors **inhalation rat** toxic concentration (other than lowest) : 20 ppm/4 hour/52 week-
intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Brain and Coverings: Tumors **inhalation rat** toxic
concentration (other than lowest) : 40 ppm/4 hour/52 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS
criteria Brain and Coverings: Tumors **oral mouse** lowest published toxic dose: 10,400 mg/kg/104 week- intermittent Tumorigenic:
Carcinogenic by RTECS criteria Gastrointestinal: Tumors **oral mouse** lowest published toxic dose: 1,300 mg/kg/2 year-
intermittent Tumorigenic: Carcinogenic by RTECS criteria Gastrointestinal: Tumors **oral mouse** lowest published toxic dose: 5,200
mg/kg/2 year- intermittent Tumorigenic: Carcinogenic by RTECS criteria Lung, Thorax, or Respiration: Bronchogenic carcinoma
oral rat lowest published toxic dose: 18,200 mg/kg/52 week- continuous Tumorigenic: Carcinogenic by RTECS criteria Brain and
Coverings: Tumors **oral rat** toxic dose : 3,640 mg/kg/52 week- continuous Tumorigenic: Neoplastic by RTECS criteria Ear:
Tumors Gastrointestinal: Tumors **oral rat** lowest published toxic dose: 2,490 mg/kg/2 year- continuous Tumorigenic: Carcinogenic
by RTECS criteria Brain and Coverings: Other degenerative changes Gastrointestinal: Tumors **oral rat** lowest published toxic dose:
960 mg/kg/48 week- continuous Tumorigenic: Carcinogenic by RTECS criteria Reproductive: Other reproductive system tumors
oral rat lowest published toxic dose: 6,000 mg/kg/600 day- intermittent Tumorigenic: Carcinogenic by RTECS criteria Brain and
Coverings: Tumors **oral rat** lowest published toxic dose: 6,420 mg/kg/600 day- continuous Tumorigenic: Carcinogenic by RTECS
criteria Ear: Tumors **Oral rat** lowest published toxic dose: 4,800 mg/kg/600 day- continuous Tumorigenic: Carcinogenic by
RTECS criteria Ear: Tumors **oral rat** lowest published toxic dose: 2,693.6 mg/kg/2 year- continuous Tumorigenic: Neoplastic by
RTECS criteria Brain and Coverings: Tumors **oral rat** lowest published toxic dose: 1,820 mg/kg/2 year- continuous Tumorigenic:
Carcinogenic by RTECS criteria Brain and Coverings: Tumors **oral rat** lowest published toxic dose: 6,115.2 mg/kg/2 year-
continuous Tumorigenic: Neoplastic by RTECS criteria Spinal Cord: Tumors **oral rat** lowest published toxic dose: 946.4 mg/kg/2
year- continuous Tumorigenic: Carcinogenic by RTECS criteria Ear: Tumors **oral rat** lowest published toxic dose: 218.4 mg/kg/2
year- continuous Tumorigenic: Carcinogenic by RTECS criteria Gastrointestinal: Tumors Skin and Appendages: Tumors **oral rat**
lowest published toxic dose: 72.8 mg/kg/2 year- continuous Tumorigenic: Neoplastic by RTECS criteria Endocrine: Tumors **oral**
rat lowest published toxic dose: 7,280 mg/kg/2 year- continuous Tumorigenic: Carcinogenic by RTECS criteria **oral rat** lowest
published toxic dose: 21.84 gm/kg/2 year- continuous Tumorigenic: Carcinogenic by RTECS criteria Brain and Coverings: Tumors
oral rat lowest published toxic dose: 7,280 mg/kg/2 year- continuous Tumorigenic: Carcinogenic by RTECS criteria
Gastrointestinal: Tumors Gastrointestinal: Colon tumors

MUTATION DATA

body fluid assay mouse Salmonella typhimurium 30 mg/kg **body fluid assay** rat Salmonella typhimurium 30 mg/kg **cytogenetic**
analysis hamster ovary 4 mmol/L **cytogenetic analysis** hamster lung 6,250 µg/L **cytogenetic analysis** hamster liver 2,500 µg/L
cytogenetic analysis inhalation human 0.8 mg/m³/146 week **DNA adduct** mammal (species unspecified) lymphocyte 68 mmol/L
DNA adduct oral rat 46,500 µg/kg **DNA adduct** rat liver 16,500 µmol/L **DNA damage** hamster ovary 3,710 mg/L **DNA damage**
hamster embryo 200 mg/L **DNA damage** human other cell types 200 mg/L **DNA damage** inhalation human 0.8 mg/m³/146 week
unscheduled DNA synthesis rat liver 1 mmol/L **unscheduled DNA synthesis** oral rat 50 mg/kg **mutation in microorganisms**
Escherichia coli 300 µmol/L (-enzymatic activation step) **mutation in microorganisms** human lymphocyte 40 mg/L (+enzymatic
activation step) **mutation in microorganisms** mouse lymphocyte 161 mg/L (+enzymatic activation step) **mutation in**

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microorganisms mouse embryo 50 mg/L (+enzymatic activation step) **mutation in microorganisms** Salmonella typhimurium 25 µL/plate (+enzymatic activation step) **mutation in microorganisms** Salmonella typhimurium 57 ppm (-enzymatic activation step) **mutation in microorganisms** Saccharomyces cerevisiae 800 µg/L (+/-enzymatic activation step) **miconucleus test** hamster ovary 100 mmol/L **gene conversion and mitotic recombination** Aspergillus nidulans 806 mg/L **gene conversion and mitotic recombination** Saccharomyces cerevisiae 14 mg/L **mutation in mammalian somatic cells** human lymphocyte 25 mg/L **mutation in mammalian somatic cells** mouse lymphocyte 12,500 nL/L **morphological transform** hamster embryo 2 mg/L **morphological transform** hamster embryo 50 mg/L/7 day **morphological transform** mouse embryo 8,800 µg/L **morphological transform** mouse fibroblast 6,300 µg/L **other mutation test systems** Oral rat 46,500 µg/kg **other mutation test systems** rat liver 16,500 µmol/L **other mutation test systems** Saccharomyces cerevisiae 500 ppm **sister chromatid exchange** hamster ovary 2 mmol/L **sister chromatid exchange** human other cell types 150 mg/L **sex chromosome loss and nondisjunction** Aspergillus nidulans 4,800 mg/L **sex chromosome loss and nondisjunction** inhalation Drosophila melanogaster 3 ppm **specific locus test** oral Drosophila melanogaster 1,520 µmol/L **specific locus test** oral mouse 600 mg/kg/6 week- intermittent **sperm morphology** Inhalation human 0.8 mg/m³/146 week

REPRODUCTIVE DATA:

Inhalation rat lowest published toxic concentration: 40 ppm/6 hour (6-15 day pregnant) Reproductive: Other effects on female Nutritional and Gross Metabolic: Weight loss or decreased weight gain **inhalation rat** lowest published toxic concentration: 80 ppm/6 hour (6-15 day pregnant) Reproductive: Specific developmental abnormalities: Musculoskeletal system **inhalation rat** lowest published toxic concentration: 25 ppm/6 hour (6-20 day pregnant) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) **intraperitoneal hamster** lowest published toxic dose: 641 mg/kg (8 day pregnant) Reproductive: Effects on fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants) Reproductive: Specific developmental abnormalities: Central nervous system **Intraperitoneal hamster** lowest published toxic dose: 641 mg/kg (8 day pregnant) Reproductive: Effects on embryo or fetus: Extra embryonic structures (e.g., placenta, umbilical cord) Reproductive: Effects on embryo or fetus: Cytological changes (including somatic cell genetic material) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) **Intraperitoneal hamster** lowest published toxic dose: 641 mg/kg (8 day pregnant) Reproductive: Specific developmental abnormalities: Central nervous system Reproductive: Specific developmental abnormalities: Musculoskeletal system **intraperitoneal mouse** lowest published toxic dose: 32 mg/kg (5 day pregnant) Reproductive: Effects on fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants) **oral mouse** lowest published toxic dose: 600 mg/kg (60 day male) Reproductive: Paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count) Reproductive: Paternal effects: Testes, epididymis, sperm duct Reproductive: Other effects on male **oral rat** lowest published toxic dose: 650 mg/kg (6-15 day pregnant) Reproductive: Effects on fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) Reproductive: Specific developmental abnormalities: Musculoskeletal system **oral rat** lowest published toxic dose: 650 mg/kg (6-15 day pregnant) Reproductive: Specific developmental abnormalities: Musculoskeletal system Reproductive: Specific developmental abnormalities: Cardiovascular (circulatory) system **oral rat** lowest published toxic dose: 644 mg/kg (2 week male) Reproductive: Paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count) Reproductive: Paternal effects: Testes, epididymis, sperm duct **oral rat** lowest published toxic dose: 650 mg/kg (6-15 day pregnant) Reproductive: Other effects on female Reproductive: Specific developmental abnormalities: Musculoskeletal system Reproductive: Specific developmental abnormalities: Cardiovascular (circulatory) system **oral rat** lowest published toxic dose: 100 mg/kg (10 day pregnant) Reproductive: Other effects to embryo or fetus **oral rat** lowest published toxic dose: 9.5 gm/kg (14 week male/14 week prior to copulation-3 week after birth) Reproductive: Effects on newborn: Viability index (e.g., # alive at day 4 per # born alive) Reproductive: Effects on newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4) Reproductive: Effects on newborn: Growth statistics (e.g., reduced weight gain) **oral rat** lowest published toxic dose: 5.7 gm/kg (22 week male/22 week prior to copulation-3 week after birth) Reproductive: Effects on newborn: Viability index (e.g., # alive at day 4 per # born alive) **oral rat** lowest published toxic dose: 5,727 mg/kg (multigeneration) Reproductive: Effects on fertility: Mating performance (e.g., # sperm positive females per # females mated; # copulations per # estrus cycles) Reproductive: Effects on newborn: Growth statistics (e.g., reduced weight gain) **oral rat** lowest published toxic dose: 13.8 mg/kg (multigeneration) Reproductive: Effects on newborn: Viability index (e.g., # alive at day 4 per # born alive) Reproductive: Effects on newborn: Growth statistics (e.g., reduced weight gain)

CARCINOGEN STATUS:

(ACGIH) Confirmed animal carcinogen (IARC) **Cancer Review** Human Limited Evidence (IARC) **Cancer Review** Animal Sufficient Evidence (IARC) **Cancer Review** Animal Sufficient Evidence (IARC) **Cancer Review** Human Inadequate Evidence (IARC) **Cancer Review** Group 2B NTP 10th Report on Carcinogens, 2002: Reasonably anticipated to be a human carcinogen NTP Carcinogenesis studies; on test (two year studies), October 2000

RTECS Compound Description:

Agricultural Chemical
Tumorigen
Mutagen
Reproductive Effector
Human Data
Primary Irritant

EPICHLOROHYDRIN:

IRRITATION DATA:

Eye rabbit 100 mg severe **eye rabbit** 100 mg/24 hour moderate **skin rabbit** 10 mg/24 hour open irritation test moderate

ACUTE TOXICITY:

Inhalation human lowest published toxic concentration: 40 ppm/2 hour Lung, Thorax, or Respiration: Other changes **inhalation human** lowest published toxic concentration: 20 ppm Olfaction: Other olfaction effects Eye: Other eye effects **inhalation mouse** lowest published lethal concentration: 72 gm/m³/9 minute N/R **inhalation rat** lethal concentration (50 percent kill): 250 ppm/8 hour N/R **Intraperitoneal guinea pig** lethal dose (50 percent kill): 118 mg/kg N/R **intraperitoneal mouse** lethal dose (50 percent kill):

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170 mg/kg N/R **Intraperitoneal rat** lethal dose (50 percent kill): 113 mg/kg N/R **Intraperitoneal rabbit** lethal dose (50 percent kill): 160 mg/kg N/R **intravenous rat** lethal dose (50 percent kill): 154 mg/kg N/R **oral guinea pig** lethal dose (50 percent kill): 280 mg/kg N/R **oral mouse** lethal dose (50 percent kill): 195 mg/kg Behavioral: Somnolence (general depressed activity) Behavioral: Tremor Behavioral: Ataxia **oral rat** lethal dose (50 percent kill): 90 mg/kg N/R **oral rabbit** lethal dose (50 percent kill): 345 mg/kg N/R **subcutaneous mouse** lowest published lethal dose: 250 mg/kg Behavioral: Muscle weakness Lung, Thorax, or Respiration: Dyspnea Kidney, Ureter, and Bladder: Changes in tubules (including acute renal failure, acute tubular necrosis) **subcutaneous rat** lethal dose (50 percent kill): 150 mg/kg Kidney, Ureter, and Bladder: Urine volume increased **skin mouse** lethal dose (50 percent kill): 250 mg/kg N/R **skin rat** lowest published lethal dose: 1 gm/kg Behavioral: Somnolence (general depressed activity) Lung, Thorax, or Respiration: Other changes Skin and Appendages: Other: Hair **skin rabbit** lethal dose (50 percent kill): 515 mg/kg N/R

TUMORIGENIC DATA:

Inhalation rat lowest published toxic concentration: 100 ppm/6 hour/30 day- continuous Tumorigenic: Carcinogenic by RTECS criteria Olfaction: Tumors Lung, Thorax, or Respiration: Acute pulmonary edema **inhalation rat** toxic concentration (other than lowest) : 100 ppm/6 hour/6 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Lung, Thorax, or Respiration: Tumors **Inhalation rat** toxic concentration (other than lowest) : 100 ppm Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Olfaction: Tumors **inhalation rat** toxic concentration (other than lowest) : 30 ppm/6 hour/57 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Olfaction: Tumors Lung, Thorax, or Respiration: Chronic pulmonary edema or congestion **Intraperitoneal mouse** lowest published toxic dose: 2,400 mg/kg/8 week- intermittent Tumorigenic: Neoplastic by RTECS criteria Lung, Thorax, or Respiration: Tumors **oral rat** lowest published toxic dose: 60 gm/kg/81 week- intermittent Tumorigenic: Carcinogenic by RTECS criteria Gastrointestinal: Tumors **oral rat** toxic dose : 36 gm/kg/81 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Gastrointestinal: Tumors **oral rat** toxic dose : 85,050 mg/kg/81 week- continuous Tumorigenic: Neoplastic by RTECS criteria Gastrointestinal: Tumors **oral rat** toxic dose : 42,525 mg/kg/81 week- continuous Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Gastrointestinal: Tumors **oral rat** toxic dose : 5,150 mg/kg/2 year- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Gastrointestinal: Tumors Endocrine: Tumors **subcutaneous mouse** lowest published toxic dose: 720 mg/kg/18 week- intermittent Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Tumorigenic: Tumors at site of application **subcutaneous mouse** toxic dose : 2,760 mg/kg/69 week- intermittent Tumorigenic: Neoplastic by RTECS criteria Tumorigenic: Tumors at site of application **unreported route mouse** lowest published toxic dose: 19 mg/kg Tumorigenic: Equivocal tumorigenic agent by RTECS criteria Blood: Lymphoma including Hodgkin's disease Skin and Appendages: Tumors

MUTATION DATA:

cytogenetic analysis hamster ovary 15 mg/L **cytogenetic analysis** hamster lung 47 mg/L **cytogenetic analysis** human lymphocyte 10 µmol/L/24 hour **cytogenetic analysis** human leukocyte 1 µmol/L **cytogenetic analysis** intraperitoneal mouse 5 mg/kg **cytogenetic analysis** oral mouse 20 mg/kg **cytogenetic analysis** inhalation mouse 5 mg/m³ **cytogenetic analysis** rat liver 10 mg/L **DNA damage** Bacillus subtilis 20 µL/disc **DNA damage** Escherichia coli 1 µmol/L **DNA damage** human mammary gland 2.8 mg/L/24 hour (-enzymatic activation step) **DNA damage** mouse lymphocyte 1,040 µmol/L **DNA damage** Intraperitoneal mouse 140 mg/kg **DNA damage** rat liver 300 µmol/L **DNA inhibition** human HeLa cell 2,700 µmol/L **DNA inhibition** human lymphocyte 5 mmol/L **DNA repair** Bacillus subtilis 997 mmol/L **DNA repair** Escherichia coli 4 µg/well **DNA repair** Saccharomyes cerevisiae 100 mg/L **unscheduled DNA synthesis** human fibroblast 32 µg/L **unscheduled DNA synthesis** human lymphocyte 500 µmol/L **unscheduled DNA synthesis** oral rat 50 mg/kg **host-mediated assay** mouse Salmonella typhimurium 50 mg/kg **host-mediated assay** mouse escherichia coli 180 mg/kg **mutation in microorganisms** Escherichia coli 1 µL/plate (+/- enzymatic activation step) **mutation in microorganisms** Klebsiella pneumoniae 200 µmol/L (-enzymatic activation step) **mutation in microorganisms** Neurospora crassa 150 mmol/L (-enzymatic activation step) **mutation in microorganisms** Salmonella typhimurium 33 µg/plate (+enzymatic activation step) **mutation in microorganisms** Saccharomyes cerevisiae 40 mg/L (-enzymatic activation step) **mutation in microorganisms** Schizosaccharomyces pombe 21 mmol/L (-enzymatic activation step) **mutation in microorganisms** Schizosaccharomyces pombe 800 µmol/L (+enzymatic activation step) **micronucleus test** Intraperitoneal mouse 120 mg/kg/16 day- intermittent **micronucleus test** multiple non-mammalian species 10,800 nmol/L **gene conversion and mitotic recombination** Saccharomyes cerevisiae 65 mmol/L **mutation in mammalian somatic cells** hamster ovary 30 mg/L **mutation in mammalian somatic cells** human other cell types 500 µmol/L **mutation in mammalian somatic cells** mouse lymphocyte 7,500 µg/L **morphological transform** hamster kidney 25 mg/L **other mutation test systems** Bacillus subtilis 1 mole/L **other mutation test systems** Escherichia coli 195 nmol/tube **other mutation test systems** Salmonella typhimurium 60 mg/L **sister chromatid exchange** hamster ovary 33 µL/L **sister chromatid exchange** hamster lung 100 mg/L **sister chromatid exchange** human lymphocyte 10 nmol/L **sister chromatid exchange** intraperitoneal mouse 5,500 µg/kg **sex chromosome loss and nondisjunction** parenteral drosophila melanogaster 5,100 µmol/L **sex chromosome loss and nondisjunction** Saccharomyes cerevisiae 100 mg/L **sperm morphology** inhalation mouse 5 mg/m³ **sperm morphology** oral rat 50 mg/kg

REPRODUCTIVE DATA:

Inhalation rat lowest published toxic concentration: 50 ppm/6 hour (50 day male) Reproductive: Effects on fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females) **inhalation rat** lowest published toxic concentration: 100 ppm/7 hour (6-15 day pregnant) Reproductive: Other effects on female Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants) **inhalation rabbit** lowest published toxic concentration: 100 ppm/7 hour (6-18 day pregnant) Reproductive: Other effects on female Reproductive: Effects on fertility: Post- implantation mortality (e.g., dead and/or resorbed implants per total number of implants) **oral mouse** lowest published toxic dose: 1,200 mg/kg (6-15 day pregnant) Reproductive: Effects on embryo or fetus: Fetotoxicity (except death, e.g., stunted fetus) **oral rat** lowest published toxic dose: 180 mg/kg (12 day male) Reproductive: Effects on fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females) **oral rat** lowest published toxic dose: 25 mg/kg (1 day male) Reproductive: Paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count) **oral rat** lowest published toxic dose: 1,050 mg/kg (21 day male) Reproductive: Paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count) Reproductive: Paternal effects: Testes, epididymis, sperm duct Reproductive: Effects on fertility: Male fertility index (e.g., # males impregnating females per # males exposed to fertile nonpregnant females) **oral rat** lowest published toxic dose: 288 mg/kg (23 day male) Reproductive: Effects on fertility: Pre- implantation mortality (e.g.,

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reduction in number of implants per female; total number of implants per corpora lutea) **subcutaneous rat** lowest published toxic dose: 75 mg/kg (1 day male) Reproductive: Paternal effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count) Reproductive: Paternal effects: Testes, epididymis, sperm duct

CARCINOGEN STATUS:

(ACGIH) Confirmed animal carcinogen (IARC) **Cancer Review** Animal Sufficient Evidence (IARC) **Cancer Review** Human Inadequate Evidence (NTP) 11th Report on Carcinogens,2004:Reasonably anticipated to be a human carcinogen

SUSPECTED CANCER AGENT: This material is not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are neither considered to be nor suspected to be cancer causing agents by these agencies.

REPRODUCTIVE TOXICITY INFORMATION: The components of these products are not reported to cause mutagenic, embryotoxic, teratogenic, or reproductive effects in humans.

ACGIH BIOLOGICAL EXPOSURE INDICES: There are no ACGIH Biological Exposure Indices (BEIs) determined for this material.

TARGET ORGANS: respiratory system, skin, eyes

HEALTH EFFECTS:

INHALATION:

Acute exposure: May cause irritation to the mucous membranes and upper respiratory tract.

Chronic exposure: Same effects as listed in acute exposure.

SKIN CONTACT:

Acute exposure: May cause dermatitis, with symptoms of inflammation and reddening of the skin. May cause an allergic reaction and sensitization in previously exposed individuals.

Chronic exposure: Same effects as listed in acute exposure.

EYE CONTACT:

Acute exposure: May cause irritation

Chronic exposure: Same effects as listed in acute exposure.

INGESTION:

Acute exposure: Ingestion is not anticipated to be a likely route of exposure to this product. No data available.

Chronic exposure: No data available.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA: This product may be harmful to terrestrial and aquatic plant and animal life (especially if large quantities are released).

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable U.S. Federal, State, and local regulations, or the applicable standards of Canada and its Provinces. Subject to disposal regulations: U.S. EPA 40 CFR 262.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Not regulated

ID NUMBER: Not applicable

HAZARD CLASS OR DIVISION: Not applicable

PACKING GROUP: Not applicable

LABELING REQUIREMENTS: Not applicable

CANADIAN (TDG) TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Not Regulated

UN/ID NUMBER: Not Applicable

CLASSIFICATION: Not Applicable

PACKING GROUP: Not Applicable

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): 1,3-Butadiene=10 lbs (45.4 kg); Styrene= 1000 lb (454 kg); Acrylonitrile=100 lbs (45.4 kg); Epichlorohydrin=100 lb (45.4 kg)

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Acrylonitrile=100 lbs (45.4 kg); Epichlorohydrin=100 lbs (45.4 kg);

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Acrylonitrile=100 lbs (45.4 kg); Epichlorohydrin=100 lbs (45.4 kg);

SARA TITLE III SARA SECTIONS 302 THRESHOLD PLANNING QUANTITY (40 CFR 355.50): Acrylonitrile=10000 lb (4540 kg); Epichlorohydrin=1000 lbs (454 kg);

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):

ACUTE: Yes

CHRONIC: Yes
FIRE: No
REACTIVE: No
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65):

1,3-Butadiene
Styrene
Methyl methacrylate
Acrylonitrile
Epichlorohydrin

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS

California Proposition 65:

1,3-Butadiene (cancer)

April 1, 1988

1,3-Butadiene (developmental, female, male)

April 16, 2004

Acrylonitrile (cancer)

July 1, 1987

Epichlorohydrin (cancer)

October 1, 1987

CANADIAN REGULATIONS

WHMIS CLASSIFICATION: D2B



EUROPEAN REGULATIONS

EC CLASSIFICATION (CALCULATED): Not determined

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): All components of this product are listed on the TSCA inventory or exempt as polymers per 40 CFR 723.259 (e)(2)

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDL): All components of this product are listed on the DSL inventory.

SECTION 16 OTHER INFORMATION

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Kaneka Texas Corporation's knowledge, the

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information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.