MSDS for OiR 620 resist

Arch Chemicals, Inc.

FOR ANY EMERGENCY, CALL 24HOURS/ 7 DAYS: 1-800-654-6911

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC(R): 1-800-424-9300

FOR ALL MSDS QUESTIONS & REQUESTS, CALL: 1-800-511-MSDS

PRODUCT NAME: OIR 620-10

I. PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 12-27-2000
SUPERCEDES: 07-13-1999

MSDS NO: 01836-0025 - 859118
SYNONYMS: None
CHEMICAL FAMILY: Organic mixture
DESCRIPTION / USE: Positive photoresist
FORMULA: Not applicable/Mixture

Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204
MATERIAL SAFETY DATAII. COMPOSITION/INFORMATION ON INGREDIENTS

CAS or CHEMICAL NAME CAS # % Range
Ethyl lactate 97-64-3 55 - 70
Novolac resin PMN-93-241 5 - 15
Ethyl-3-ethoxypropionate 763-69-9 5 - 15
Novolak polymer, reaction products with naphthoquinone diazide ester
Proprietary 2 - 12
Naphthoquinone diazide ester derivative LVE-97-0011 2 - 10
Substituted phenol Proprietary 0 - 10

III. HAZARDS IDENTIFICATION

OSHA Hazard Classification: combustible liquid, eye irritant, skin irritant, respiratory irritant, central nervous system depressant

Routes of Entry: Inhalation, skin, eyes, ingestion
Chemical Interactions: No known interactions
Medical Conditions Aggravated: None known or reported

Human Threshold Response Data
Odor Threshold:
Propanoic acid, 2-hydroxy-, ethyl ester recognition: 1.42 ppmdetection: 0.801 ppm
Propanoic acid, 3-ethoxy-, ethyl ester detection: 0.07 ppmrecognition: = 0.1 ppm
Irritation Threshold: Not established

Hazardous Materials Identification System/National Fire Protection

Association Classifications
Hazard Ratings: Health Flammability Reactivity
HMIS 2 2 1
NFPA Not established

Immediate (Acute) Health Effects
Inhalation Toxicity: Not expected to be toxic by inhalation. Inhalation of high concentrations may result in central nervous system (CNS) effects such as dizziness, weakness, fatigue, nausea, headache, and lack of coordination.
Inhalation Irritation: High concentrations may be slightly irritating to the eyes, nose, throat, and lungs.
Skin Contact: Skin contact may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage. Prolonged skin contact may cause a yellow discoloration if not properly washed off.
Eye Contact: Contact may cause moderate irritation consisting of transient redness, swelling, and mucous membrane discharge to the conjunctiva. No corneal involvement or visual impairment is expected.
Ingestion Irritation: Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy or diarrhea.
Ingestion Toxicity: Not expected to be toxic by ingestion unless large amounts are swallowed.

AcuteTarget Organ Toxicity: Central nervous system, Eyes, Skin, Respiratory Tract

Prolonged (Chronic) Health Effects
Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.
Reproductive and Developmental Toxicity: No reproductive or developmental risk to humans is expected from exposure to this product.

Inhalation: There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.
Skin Contact: Dermal contact may cause defatting of skin and/or dermatitis.
Ingestion: There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.

Chronic Target Organ Toxicity: Skin
Supplemental Health Hazard Information: No additional health information available.

IV. FIRST AID

Inhalation: IF INHALED: Remove individual to fresh air. If respiratory irritation develops, call a physician.
Skin Contact: IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Call a physician.
Eyes: IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids apart. Call a physician immediately.

Ingestion: IF SWALLOWED: Immediately drink water to dilute. Consult a physician if symptoms develop. Never give anything by mouth to an unconscious person.

V. FIRE FIGHTING MEASURES

Flammability Summary (OSHA): Combustible.

Flammable Properties
Flash Point: Approximately 53 Deg. C. / Approximately 127 Deg. F.
Autoignition Temperature: No data

Upper Flammable/Explosive Limit, % in air: No data
Lower Flammable/Explosive Limit, % in air: No data

Fire/Explosion Hazards: Vapors may be ignited by sparks, flames or other sources of ignition if material is above the flash point giving rise to a flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Dust may be ignitable if mixed with air in the presence of an ignition source.
Extinguishing Media: Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires.
Fire Fighting Instructions: In case of fire, use normal fire fighting equipment including a NIOSH approved self-contained breathing apparatus (SCBA). Use water to cool containers.
Hazardous Combustion Products: Oxides of nitrogen, carbon monoxide, carbon dioxide

VI. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations: Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.

Spill Mitigation Procedures
Air Release: Hazardous concentrations in air may be found in local spill area and immediately downwind. Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.
Water Release: This material is slightly soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste. Continue to handle as described in land spill.
Land Release: Create a dike or trench to contain materials. Do not place spill materials back in their original containers. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water.
Additional Spill Information: Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section XIII, Disposal Consideration. This material may be neutralized for disposal; you are requested to contact Arch Chemicals at

1- 800-654-6911 before beginning any such procedure.

VII. HANDLING AND STORAGE

Handling: Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing (dust, vapor, mist, gas). Keep container closed when not in use. Ground and bond containers when transferring material.
Storage: Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Outside or detached storage is preferred.Store in a tightly closed container.Contents may develop pressure upon prolonged storage. Use caution when opening.Do not allow out-of-date product to accumulate.Do not expose to direct light.
Shelf Life Limitations: See label or certificate of analysis for shelf life if applicable.
Incompatible Materials for Storage: Refer to Section X, "Incompatible Materials."

VIII. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep exposure to airborne contaminants below the TLV, PEL, or other recommended exposure limit and/or maintain operator comfort. Use explosion-proof ventilation equipment when handling this product.

Protective Equipment for Routine Use of Product
Respiratory Protection: Wear a NIOSH approved respirator if any exposure occurs.
Respirator Type(s): A NIOSH approved air purifying respirator with organic vapor cartridge. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.
Skin: Wear impervious gloves to avoid skin contact. Follow good industrial hygiene practices.
Eyes: Use chemical goggles.
Protective Clothing Type: Impervious

Exposure Limit Data

CHEMICAL NAME	CAS #	OSHA PEL / STEL	ACGIH LIMITS	ACGIH WEEL
Ethyl 3-ethoxypropanoate	763-69-9	None established	None established	Not Established

Ethyl 3-ethoxypropanoate: Manufacturer recommends 50ppm (8hr TWA); 100ppm STEL.

CHEMICAL NAME NIOSH Immediately Dangerous to Life or Health:
The IDLH has not been established for this product.

IX. PHYSICAL DATA

Physical State: Solution
Color: yellow red
Odor mild ester-like
Molecular Weight: Not Applicable/Mixture
pH (@ 25 Deg. C) Not applicable

Octanol/Water Coeff: No data
Solubility in Water: Slight
Bulk Density: No data
Specific Gravity: No data
Vapor Density: > 1.00 (air =1)
Vapor Pressure: (@ 25 Deg. C) No data
Evaporation Rate: No data
Volatiles, % by vol.: 65 - 80 %
Boiling Point: No data
Freezing Point: No data

X. STABILITY AND REACTIVITY

Stability and Reactivity Summary: Stable under normal conditions. May become unstable at elevated temperatures and/or pressure. Static discharge may cause ignition at temperatures at or above the flash point. Not sensitive to mechanical shock.
Reactive Properties: Combustible
Hazardous Polymerization: Will not occur
Conditions to Avoid: Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility: strong oxidizing agents
Hazardous Decomposition Products: carbon dioxide, carbon monoxide, oxides of nitrogen, formaldehyde, Cresols, Lactic acid, ethanol

Decomposition Temperature: > 50 Deg. C. > 122 Deg. F.
Product May Be Unstable At Temperatures Above: 10 Deg. C. 50 Deg. F.

XI. TOXICOLOGICAL INFORMATION
Component Animal ToxicologyOral LD50 value:
Propanoic acid, 2-hydroxy-, ethyl ester Oral LD50 Rat > 5 g/kg
Propanoic acid, 3-ethoxy-, ethyl ester Oral LD50 Male rat > 5 g/kgOral LD50 Female rat = 4.3 g/kg
Dermal LD50 value:
Propanoic acid, 2-hydroxy-, ethyl ester Dermal LD50 Rabbit > 2 g/kg
Propanoic acid, 3-ethoxy-, ethyl ester Dermal LD50 Guinea pig > 19 g/kg
Inhalation LC50 value:
Propanoic acid, 3-ethoxy-, ethyl ester Inhalation LC50 (6h) Rat > 1000 ppm

Product Animal Toxicity
Oral LD50 value: Rat Believed to be 4 - 5 g/kg
Dermal LD50 value: Rabbit Believed to be > 2 g/kg
Inhalation LC50 value: No data
Skin Irritation: This material is expected to be moderately irritating.
Eye Irritation: This material is expected to be moderately irritating.

Reproductive and Developmental Toxicity: No reproductive or developmental risk to humans is expected from exposure to this product.
Component Data:
Propanoic acid, 2-hydroxy-, ethyl ester This chemical has been tested in laboratory animals and no evidence of teratogenicity was seen.
Propanoic acid, 3-ethoxy-, ethyl ester This material has been tested in laboratory animals and no evidence of teratogenicity or embryotoxicity was seen.

Mutagenicity: Not known or reported to be mutagenic.
Component Data:
Propanoic acid, 2-hydroxy-, ethyl ester This chemical did not show mutagenic activity when tested in the Salmonella/Mammalian Microsome Plate Incorporation Mutagenicty Assay.
Novolac resin This product has been shown to be non-mutagenic based on a battery of assays.
Propanoic acid, 3-ethoxy-, ethyl ester This material was non-mutagenic in the Ames test.

Carcinogenicity: This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

XII. ECOLOGICAL INFORMATION

Ecological Toxicity Values:
Propanoic acid, 2-hydroxy-, ethyl ester 96 hr. LC50: = 100 - 1000 ppm
Propanoic acid, 3-ethoxy-, ethyl ester Fathead minnow, 96 hr. LC50: = 65 mg/l.Water flea (Daphnia magna), 96 hr. LC50: > 100 uL/L

XIII. DISPOSAL CONSIDERATIONS

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF
THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLICANCE WITH ALL RELEVANT
LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE
AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

Waste Disposal Summary: Spent or discarded material is a hazardous waste.
Potential US EPA Waste Codes: D001
Disposal Methods: As a hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by incineration.

Components subject to land ban restrictions: Ethyl lactate (D001)Ethyl 3-ethoxy propionate (D001)

XIV. TRANSPORTATION INFORMATION
THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.
DOT Description (49 CFR 172.101):Land (U.S. DOT): COMBUSTIBLE LIQUID, N.O.S.(CONTAINS ETHYL LACTATE, ETHYL 3-ETHOXYPROPIONATE) , NA1993 PGIII

Air (IATA/ICAO): FLAMMABLE LIQUID, N.O.S., (ETHYL LACTATE, ETHYL 3-ETHOXYPROPIONATE), 3, UN1993, PGIII
Water (IMO): FLAMMABLE LIQUID, N.O.S., (ETHYL LACTATE, ETHYL 3-ETHOXYPROPIONATE), 3.3, UN1993, PGIII
Flash Point: (C) 53

Hazard Label/Placard: (Primary) LAND: NONEAIR/WATER: FLAMMABLE LIQUID

Emergency Response Guide Number: 128

XV. REGULATORY INFORMATION

UNITED STATES:
Toxic Substances Control Act (TSCA): The components of this product are either listed on the Toxic Substances Control Act Chemical Substances Inventory or are introduced into commerce in accordance with the provisions of a low volume PMN exemption notification.

Pesticide acceptance indication: US EPA Registration Number: Not applicable

Superfund Amendments and Reauthorization Act (SARA) Title III:
Hazard Categories Sections 311/312 (40 CFR 370.2):
Health: Acute
Physical: Fire

Emergency Planning & Community Right to Know (40 CFR 355, App. A):
Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
Not applicable
Reportable Quantity (40 CFR 302.4):
None listed

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components
No 313-listed chemicals in this product

State Right-to-Know Regulations Status of Ingredients
Pennsylvania: Propanoic acid, 2-hydroxy-, ethyl ester
New Jersey: Ethyl lactate
Massachusetts: Ethyl lactate

XVI. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revised to meet the ANSI standard of 16 sections.

MAJOR REFERENCES:

? Curren, R.D. and Mecchi, M.S., Final Report, Salmonella/Mammalian Microsome Plate Incorporation Mutagenicity Assay for Ethyl Lactate. MBA, T 8281.501, October 11, 1988.
? Hoberman, A.M., Final Report, Developmental Toxicity Study of Ethyl Lactate Administered Percutaneously to Crl:CD (SD) BR Presumed Pregnant Rats. Argus Research Laboratories, Inc., September 8, 1989.

. Krasave, W.J. and G.V. Katz. The Developmental Toxicity of Ethyl-3-Ethoxypropionate in the Rat. Eastman Kodak Company Unpublished Report. June 25, 1984.
. An Inhalation Developmental Toxicity Study in Rabbits with Ethyl 3-Ethoxypropionate. Bio/dynamics, Inc. East Millstone, NJ, Project No. 86-3035, March 17, 1987.
. Eastman Chemical Products, Inc., Kingsport, Tennessee, MSDS "Ektapro" EE Solvent, July 7, 1992.
. Boggs, A. A Comparative Risk Assessment of Casting Solvents for Positive Photoresists. Appl. Ind. Hyg. 4(4):81-87, 1989.

. Olin Unpublished Report, "Odor Threshold Studies Performed with Methyl-3-Methoxypropionate, Ethyl-3-Ethoxypropionate, Propylene Glycol Methyl Ether Acetate and Ethyl Lactate", Prepared by TRC Environmental Corporation, Windsor, CT, TRC #1615-0000-00000, September 26, 1994.

Other references available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION INTHIS MSDS SHOULD BE PROVIDEDTO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION
HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS
DOCUMENT IS CURRENT.