MATERIAL SAFETY DATA SHEET

“Photoneece”DL-1000

MSDS No.:H3E-DE0003

Toray Industries,Inc.

Date■December.21.2001

1.1 NAME OF MANUFACTURER / SUPPLIER

ADDRESS: 8-1,Mihama 1-chome,Urayasu,Chiba 279-8555,JAPAN

DIVISION: Elestronics and Information Related Products Division

1.2 SAFETY MANAGER

PRODUCTION,TECHNOLOGY

DEP.: Electronics Related Products Technical Dept.

MANAGER: Takao Kinasi

SALES

DEP.: Electronics and Information Materials 2nd Dept.

MANAGER: Yoshio Kawahara

1.3 MSDS MANAGER

DEP.: Electronics Related Products Technical Dept.

MANAGER: Shigeru Suzue

1.4 INFORMATION CENTER (CUSTOMER SERVICE CENTER)

SECTION: Electronics Related Products Technical Dept.

ADDRESS: 1-1-1,Sonoyama,Ootu-si,5208558,Japan

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CHEMICAL NAME : Photosensitive polyimide precursor solution

GENERIC NAME :

ABBREVIATION NAME:

SUBSTANCE( )MIXTURE(O) ; UN CLASS & UN NUMBER■3.3,1993

CHEMICAL NAME	COMP. (%)	CHEMICAL FORMULA (CONSTITUTIONAL FORMULA, STRUCTUAL FORMULA)	CAS No	TSCA
Polyimide precursor	ca.17		N.Regd.	N.Regd.
Ethyl lactate	ca.30	C5H10O3	97-64-3	OD5075000
γ-Butyrolactone(γ-BL)	ca.48	C4H6O2	96-48-0	LU3500000
additives	ca. 5		N.Regd.	N.Regd.

3.1 CLASS NAME OF HAZARDOUS CHEMICALS FOR MSDS IN JAPAN

Flammable liquids.

3.2 PHYSICAL & CHEMICAL HAZARDS

Explosive :

Vapors may catch fire and explode.

Noncombustible :

R10-Flammable.

3.3 ADVERSE HUMAN HEALTH EFFECTS

Irritant Substances :

R36-Irritating to eyes.

R37-Irritating to respiratory system.

R38-Irritating to skin.

3.4 ENVIRONMENTAL EFFECTS

4.1 INHALATION

Remove the victim from the contamination immediately to fresh air.

Keep the victim warm and quiet.

If breathing is week■irregular or has stopped■open his airway■loosen his collar and belt and administer artificial respiration.

Arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

If you feel unwell■seek medical advice(show the label where possible).

4.2 SKIN CONTACT

Remove all contaminated clothing■shoes and socks from the affected areas as quickly as possible■cutting them off if necessary. Wash the affected area under tepid running water using a mild soap. If irritation persists■arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

4.3 EYE CONTACT

Gently rinse the affected eyes with clean water for at least 15 minutes. Arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

4.4 INGESTION

Rinse mouth with water. Give the person one or two glasses of water■try to get the victim to vomit by having the victim touch the back of their throat with a finger.

Do not give an unconscious person anything to drink.

Do not make an unconscious person vomit.

Arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

5.1 SPECIFIC HAZARDS WITH REGARD TO FIRE-FIGHTING MEASURES :

Apply water from a safe distance to cool and protect surrounding area.

Firefighters should wear proper protective equipment.

Keep personnel removed from and upwind of fire.

Shut off fuel to fire if possible to do so without hazard.

Evacuate personnel to safe area.

5.2 EXTINGUISHING MEDIA :

In case of fire■use water spray■foam■dry chemical powder or carbon dioxide.

6.1 MEASURES FOR HANDLING PERSONNEL :

Evacuate non essential personnel.

Wear proper protective equipment.

Shut off all sources of ignition; No flames■smoking or flames in area.

6.2 MEASURES FOR ENVIRONMENTAL EFFECTS :

Prevent spills from entering sewers■watercourses or low areas.

Do not wash away into shower or waterway.

6.3 MEASURES WHEN HANDLING SPILLED SUBSTANCES

Absorb spill with inert material (e.g.■dry sand or earth)■then place in a chemical waste containers using non-sparking tools. Flush residual spill (area) with copious amounts of water.

7.1 HANDLING :

Exposure control for handling personnel:

S51-Use only in the well-ventilated areas.

S24/25-Avoid contact with skin or eyes.

S16-Keep away from sources of ignition -No smoking.

Protective measures against fire & explosion:

Shut off all gas pilot and electrical(spark or hot wire) ignites and other sources of ignition during use and until all vapors(odors) are gone.

Prevent build-up of electrostatic charges(e.g.■by grounding).

Others:

Protect against physical damage.

Avoid rough handling or dropping.

7.2 STORAGE:

Keep away from heat■steam pipe or sunlight.

Avoid long storage periods since the product degrades with age.

Incompatibility (Specific materials to be avoided): organic peroxides

8.1 CONTROL PARAMETERS

	CONTENT	Polyimide precursor	Ethyl lactate	γ-Butyrolactone(γ-BL)	Additives
LABOR SAFETY & HEALTH ACT(JAPAN)	ppm(mg/m3)	N.A.	N.A.	N.A.	N.A.
ACGIH	ppm(mg/m3)	N.A.	N.A.	N.A.	N.A.

8.2 ENGINEERING MEASURES :

Handle this material only in a totally enclosed system.

Use with local exhaust ventilation.

8.3 PERSONAL PROTECTIVE EQUIPMENT

Respiratory protection :

Consider the type of application■environmental concentrations and materials being used concurrently when determining respirator selection and use.

Eye protection :

S39-Wear protective eyeglasses or chemical safety goggles.

Hand, skin and body protection :

S36-Wear suitable protective clothing.

S37-Wear suitable glove.

Reference:A

Appearance :	Appearance: Semi-viscous liquid	Odor:	Characteristic odor
Density:	1.1	Boiling point:	154■(EL) 204■(γ-BL)
Melting point:	-25■(EL) -42■(γ-BL)	Vapor pressure:	2.79hPa(EL 20■) 2.0hPa(γ-BL 20■)
Vapor density:	N.A.	Solubility(%) in water	Insoluble
		in others	precipitation

Volatility:	slower than diethl■lether	Others:	

Reference:A

Flash point:	61■	Autoignition temperature:	400■(EL) N.A.(γ-BL)
Explosion limit(%) Upper	11.4%(EL) 16.0%(γ-BL)	Combustibility Spontaneous-	None
Lower	1.5%(EL) 1.4%(γ-BL)	Reactivity with water	None
Flammability:	None	Dust explosion:	None
Oxidizibility:	None	Self-reactivity:	None

Vapors may catch fire and explode.

May form explosive peroxides.

Incompatibility: Oxidizing agents.

Reference:A

Acute toxicity:

EL Oral mouse LD50 2500mg/kg-bw

rat LD50 >5000mg/kg-bw

γ-BL Oral rat LD50 1203mg/kg-bw

Skin rabbit LD50 >5000mg/kg-bw

Intravenous mouse LD50 345mg/kg-bw

Mist or vapor inhalation may cause slight irritation of nose,throat and eyes.

Toxicity of oral intake is middle level.

Sub-chronic toxicity:

N. A.

Chronic toxicity:

N. A.

Carcinogenic effects:

N. A.

Mutagenic effects:

N. A.

Irritant properties:

Skin■May cause dry skin and removal of greasy components on contact,even in a small amount,

and also cause detertitis and even skin abruption on prolonged contast with liquid.

Eyes:May cause irritation and conjunctivis.

Allergenic and sensitizing effects:

N. A.

Teratogenic effects:

N. A.

Others:

Physiological action (γ-BL): γ-BL and its hydrolysis product,

γ-h■droxybutyric acid (GHB) have a narcotic action, the latter of which

appears to be more potent.

γ-BL and GHB ester have activity of a sedative acting on the central nerve system.

Intraperitoneal injection of γ-BL (250 mg/kg) to rats increases the concentration of

dopamine and exponentially decreased the concentration of tyrosine in the brain.

Reference:A

Biodegradability :

N. A.

Bioaccumulation :

N. A.

Fish toxicity :

N. A.

Reference:A

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber.

Do not dump into sewers■on the ground or into any body of water.

Do not discharging into drains or the environment.

This material and/or its container must be disposed of as hazardous waste.

14. TRANSPORT INFORMATION

Reference:

Follow all regulations in your country,state et al.

In the case of transportation, check a leak from a packs or botles,and lord these properly.

15. REGULATORY INFORMATION

REGULATORY

REGULATORY■	CLASSIFICATION	Reg. Info.	SUBSTANCES NAME	ALLOWED CONCENTRATION
TSCA(USA) No		-		
EINECS No.		-		
CALIFORNIA PROPOSITION 65		-		
FDA		-		
UL		-		
CAS		-		
OSHA		-		

16.1 Other information

This information contained in this data sheet represents the best information currently available to us. However■no warranty is made with respect to its completeness and we assume no liability resulting from its use. It is advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

Note

(R-number) in front of the Risk description is given by Commision Directive 97/548/EEC ANEX ■

to indentify the description,Nature of special risk attribeted to dangerous substances and preparations.

(S-number) in front of the Safety description is given by Commision Directive 97/548/EEC ANEX ■

to indentify the description,Safety advice concerning dangerous substances and preparations.

16.2 References

	Contents	Editor & Press
A	MSDS of Raw Materials	
B	Guidebook of MSDS,(1992)	Japan Chemical Industry Ecology-Toxicology & Information Center.
C	International Chemical Safety Cards (ICSC),(1994)	International Program on Chemical Safety 1994.
D	Handbook of Existing &New Chemical Substances,(1991)	The Chemical Daily Co; Ltd.
E	List of Carcinogen,(1994)	Japan Chemical Industry Ecology-Toxicology & Information Center.
F	Multagenic Substances List,(1996)	Japanese Ministry of Labor <Japanese Version only>.
G	Commission Directive 67/548/EEC,(1996)	ANNEX I,II,III,IV,VI.
I	The Sigma-Aldrich Library of Chemical Safety Data,(1988)	Sigma-Aldrich Corporation.
J	Chemical Substances & Japanese Regulations,(1992)	The Chemical Daily Co; Ltd.
K	Chemi-INDEX,(1992)	The Chemical Daily Co; Ltd.
L	Toxic Substances Control Act Chemical Substances Inventory	U.S. Environmental Protection Agency.
X	Commission Directive 93/21/EEC,(1996)	ANNEX I,II,III,IV.