

PRODUCT NAME: **JSR KRF M91Y**

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: **JSR KRF M91Y**
General Use: Photoresist for Integrated Circuit Production
Product Description: Photosensitizer and Polyhydroxystyrene Derivatives Solution

MANUFACTURER: JSR Micro, Inc.
1280 North Mathilda Ave.,
Sunnyvale, CA 94089
Telephone: +1-408-543-8800

EMERGENCY TELEPHONE NUMBERS:
CHEMTREC: +1-800-424-9300
(in USA) 24Hrs Every day

2. COMPOSITION / INFORMATION ON INGREDIENTS

	%	CAS No.
Polyhydroxystyrene derivative	5-20	Proprietary
Sulfonyl compound	Less than 3	Proprietary
Ethyl lactate (EL)	50-70	97-64-3
Propyleneglycolmonomethyletheracetate (PGMEA)	20-30	108-65-6

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Pale yellowish viscous liquid with an ester-like odor.

POTENTIAL HEALTH EFFECTS

INHALATION:

May cause irritation to nose, throat and anesthesia.

EYE CONTACT:

Eye contact may cause mild irritation.

SKIN CONTACT:

Prolonged and repeated contact with skin may cause irritation and dermatitis.

INGESTION:

Swallowing may nauseate and cause pain in esophagus and stomach.

CARCINOGENICITY:

Not known to be carcinogenic.

NTP: No

IARC MONOGRAPHS: No

OSHA Regulated: No

SIGNS AND SYMPTOMS:

Eye and skin irritation, nausea, pain in esophagus, stomach, and anesthesia.

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

PRODUCT NAME: **JSR KRF M91Y**

4. FIRST AID MEASURES

INHALATION:

Remove exposed person to fresh air; perform artificial respiration if necessary.

EYE CONTACT:

Immediately flush eyes with plenty of water at least 15 min. Call a physician.

SKIN CONTACT:

Flush skin with water and soap.

INGESTION:

Give large quantities of water, contact a poison center and call physician immediately.

NOTE TO PHYSICIAN:

Treatment may vary with condition of victim and specifics of incident.

5. FIRE-FIGHTING MEASURES

GENERAL HAZARD:

Combustible liquid. May release vapors that form flammable mixtures when temperatures are at or above the flash point. Toxic gases will form upon combustion.

EXTINGUISHING MEDIA:

Carbon dioxide, alcohol foam or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES:

Water should be used to keep fire exposed containers cool and to disperse vapors. Firefighters should wear self-contained breathing apparatus.

FIRE AND EXPLOSION HAZARDS:

Combustible liquid. Toxic gases, smoke, and oxides of Carbon will form upon combustion.

6. ACCIDENTAL RELEASE MEASURES

LARGE SPILL/SMALL SPILL:

For indoor spills, provide increased ventilation as required to minimize exposure. Contain, absorb, and cleanup the spill as indicated in the appropriate land or water section below. Dispose of absorbent and other waste in an appropriate chemical waste container. Wear proper personal protective equipment. Wash thoroughly after handling.

LAND SPILL:

Dike or absorb with inert absorbent material and transfer to D.O.T. container for disposal.

WATER SPILL:

Remove from surface by skimming or with suitable absorbent.

7. HANDLING AND STORAGE

GENERAL:

Store in original container in a dry area. Avoid heat, sunlight, and ignition sources. Open only under safe light and well ventilated conditions. Loosen closure cautiously before opening. When using this substance: (a) avoid breathing the substance; (b) avoid ingestion; (c) use respiratory protection when in dust or mist form. Wear chemical goggles, resistant gloves and protective clothing to prevent contact. Wash thoroughly after handling.

STORAGE TEMPERATURE: -4 to 41°F (-20 to 5C)

STORAGE PRESSURE: Atmospheric

PRODUCT NAME: **JSR KRF M91Y**

8.EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

RESPIRATORY PROTECTION:

Under conditions of frequent use or heavy exposure, Respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

Any chemical cartridge respirator with organic vapor cartridge(s).

Any chemical cartridge respirator with a full facepiece and organic Vapor cartridge(s).

Any air-purifying respirator with a full facepiece and an organic Vapor canister.

For Unknown Concentrations or Immediately Dangerous to Life or Health.

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

SKIN PROTECTION:

Wear impermeable gloves and clothing during activities where there is potential for direct skin contact with chemical.

EYE PROTECTION:

Wear primary eye protection such as splash resistant safety goggles with a secondary protection faceshield. Provide an emergency eye wash station and quick drench shower in the immediate work area.

EXPOSURE GUIDELINE (S):

OSHA HAZARDS (29 CFR 1910.1200) Exposure Limits 8 hrs. TWA (ppm)

COMPONENT	OSHA PEL	ACGIH TLV
Polyhydroxystyrene derivative	not established	not established
Sulfonyl compound	not established	not established
EL	not established	not established
PGMEA	100 ppm*	not established

* Denotes a Cal-OSHA standards

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure: 4mmHg at 20°C
 Specific Gravity: 0.9~1.1
 Solubility in water: Moderate
 Boiling Point: 146°C
 Flashpoint and Method: 42°C
 Flammable Limits: LFL; 1.5% UFL; 11.4%
 Autoignition 354°C
 Temperature:

10. STABILITY AND REACTIVITY

PRODUCT NAME: **JSR KRF M91Y**

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID)

Strong oxidizing agents, strong acids, strong bases.

STABILITY: (CONDITIONS TO AVOID)

Materials containing similar structural groups are normally stable. This material maybe sensitive to peroxide formation.

HAZARDOUS DECOMPOSITION PRODUCTS:

Combustion will produce toxic vapors and gases.

HAZARDOUS POLYMERIZATION:

May not occur.

11. TOXICOLOGICAL INFORMATION

SOLVENT (EL)

ACUTE TOXICITY

Dermal	LD50	Rabbit	>5 g/kg
Oral	LD50	rat	>2,000 mg/kg
Oral	LD50	mouse	2,500 mg/kg

SOLVENT (PGMEA)

ACUTE TOXICITY

Oral	LD50	rat	8,532 mg/kg
Oral	LD50	rabbit	>5 g/kg

Sulfonyl compound 1:

MUTAGENICITY

Ames test:	Negative
Chromosomal Aberration Test:	Positive
Micronucleus test:	Negative

Sulfonyl compound 2:

ACUTE TOXICITY

Oral	LD50	rat	2,000 mg/kg
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MUTAGENICITY

Ames test:	Negative
Chromosomal aberration test:	Negative

Polyhydroxystyrene derivative: No information available

12. ECOLOGICAL INFORMATION

Biodegradation

SOLVENT:

EL;	No information available
PGMEA;	100% degradable after 8 days. 5,000 ug/L 24 year (Stress) Sea Lamprey (Petromyzon marinus)

Sulfonyl compound: No information available

Polyhydroxystyrene derivative: No information available

13. DISPOSAL CONSIDERATION

The user of this product must properly characterize the waste generated from the use of this product in accordance with all applicable federal, state and/or local laws and regulations in order to determine the proper disposal of the waste in accordance with all applicable federal, state and/or local laws and regulations.

14. TRANSPORT INFORMATION

TRANSPORTATION AND HAZARDOUS MATERIALS DESCRIPTION:

PRODUCT NAME: **JSR KRF M91Y**

Package and transport in accordance with Department of Transportation (DOT) and other regulatory agency requirements.

U. S. DOT PROPER SHIPPING NAME: Resin solution, 3, UN1866, III
IATA PROPER SHIPPING NAME: Resin solution
IDENTIFICATION NUMBER: UN 1866

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200: Ensure that the hazards associated with this product are transmitted to employees by means of a hazard communications program, in accordance with federal and state Occupational Safety and Health Administration (OSHA) regulations.

CERCLA/SUPERFUND HAZARD CATEGORY: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 302.4. The list should be periodically checked for applicable updates.

SARA 313 INFORMATION: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 372. The list should be periodically checked for applicable updates.

TOXIC SUBSTANCES CONTROL ACT (TSCA): All of the compounds in this product are on the TSCA Inventory and/or are subject to a Low Volume Exemption. In accordance with federal regulations, this Photoresist shall be used only to manufacture integrated circuits. In particular, this material shall not be distributed to any person, other than for disposal, until after it has been completely reacted on integrated circuits or similar media. All users must utilize the worker protection measures and environmental release controls specified in this Material Safety Data Sheet and in EPA and OSHA regulations. Acknowledgment of receipt of this Material Safety Data Sheet shall be considered acknowledgment that the user will comply with these requirements.

CALIFORNIA PROPOSITION 65: At the time of this document's preparation, none of the ingredients of this product were included on the California Proposition 65 list of chemicals known to cause cancer or reproductive toxicity. The list should periodically be checked for applicable updates.

16. OTHER INFORMATION

REVISION SUMMARY

March 24, 2000	Original MSDS established.
April 13, 2000	Revision 1 established.
April 26, 2000	Revision 2 established.
May 15, 2000	Revision 3 established.
April 26, 2005	Revision 4 established.
March 6, 2006	Revision 5 established.
June 12, 2006	Revision 6 established.
September 2, 2008	Revision 7 established.
May 20, 2009	Revision 8 established.
November 30, 2009	Revision 9 established.
July 8, 2011	Revision 10 established.

To the best of our knowledge, the information contained herein is accurate. However, neither JSR Corporation nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final

PRODUCT NAME: **JSR KRF M91Y**

determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards, which exist.