Pioneer Forensics LLC
VERITATEM PER EVIDENTIA
"Truth Through Evidence"

SDS

Safety Data Sheet

1. IDENTIFICATION

Product Identifier: **RAY Reagent**

Product Code(s): PF30104

Synonyms: Mixture.

Recommended Use: For manufacturing, industrial, and laboratory use only. Use as a laboratory reagent.

Uses Advised Against: Not for food, drug, or household use.

Supplier:
Pioneer Forensics, LLC
6801 West 20th Street, Suite 204
Greeley, CO 80634
Phone: (970) 515-5420

Emergency Phone Number: For health emergency, call poison control: (800) 222-1222.

2. HAZARDS IDENTIFICATION

Hazard Classifications:

Acute Toxicity – Oral:	Category 4
Acute Toxicity – Dermal:	Category 4
Acute Toxicity – Inhalation:	Category 4
Specific Target Organ Toxicity (Single Exposure):	Category 1
Flammable Liquids:	Category 2

Signal Word: DANGER

Hazard Statements:
Harmful if swallowed.
Harmful in contact with skin.
Harmful if inhaled.
Causes damage to organs.
Highly flammable liquid and vapor.

Pictograms:

Precautionary Statements:

Prevention:
Wash thoroughly after handling.
Do not eat, drink, or smoke when using this product.
Wear protective gloves, protective clothing, eye protection, and face protection.
Do not breathe fume, mist, vapors, or spray.
Use only outdoors or in a well-ventilated area.
Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.
Keep container tightly closed.
Ground container and receiving equipment.
Use explosion-proof electrical, ventilating, lighting, and transportation equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.

Response:
If exposed: Call a poison center or doctor.
If swallowed: Rinse mouth.
If on skin (or hair): Wash with plenty of water. Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
In case of fire, use water spray, dry powder, alcohol resistant foam, or carbon dioxide to extinguish.

Storage:
Store locked up.
Store in a well-ventilated place. Keep cool.

Disposal:
Dispose of contents and container in accordance with local, regional, national, and international regulations.

Hazards Not Otherwise Classified:
This product is harmful to humans. Primates are especially susceptible to the toxic effects of methanol, which are not reflected through toxicity data (see Section 11).

Toxicity Statement:
Not applicable.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Component	Common Name / Synonyms	CAS#	Chemical Formula	% by Weight
Ethanol	Ethyl Alcohol	64-17-5	C_2H_5OH	85.0
Methanol	Methyl Alcohol	67-56-1	CH_3OH	4.23
Isopropanol	Isopropyl Alcohol	67-63-0	C_3H_7OH	4.69
Acetonitrile	Methyl Cyanide	75-05-8	C_2H_3N	4.96
Petroleum Distillates	-	64742-46-7	Mixture	0.467
Dipropylene Glycol Butoxy Ether	Di(Propylene Glycol) Butyl Ether	29911-28-2	$C_{10}H_{22}O_3$	0.117
Trade Secret*	*	*	*	0.311
Rhodamine 6G	Basic Red 1	989-38-8	$C_{28}H_{31}O_3N_2Cl$	0.127
Basic Yellow 40	No information found	29556-33-0	$C_{22}H_{24}O_2N_3Cl$	0.127

Trade Secret Statement:
*The specific identifiers of this component have been withheld under a trade secret. Any effects of these concentrations on the overall hazard classification of this product are considered, and health and safety information are provided where applicable.

4. FIRST AID MEASURES

First Aid Procedures:

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious, or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a physician if symptoms occur.

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head low so that vomit does not enter lungs. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or poison control center if symptoms occur.

Skin Contact: Remove contaminated clothing and shoes. Wash skin with plenty of water for at least 15 minutes. Wash clothing before reuse. Call a physician if symptoms occur.

Eye Contact: Check for and remove contact lenses if present and easy to do. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician if symptoms occur.

General Advice: Poison information centers in each state can provide additional assistance for scheduled poisons. Ensure that medical personnel and those providing first aid are aware of the material(s) involved and take precautions to protect themselves.

Symptoms and Effects: Inhalation may cause drowsiness, dizziness, headache, suffocation, shortness of breath, hoarseness, and coughing. Ingestion may cause unconsciousness, visual disturbances, metabolic acidosis, impaired judgment, impaired coordination, nausea, vomiting, diarrhea, abdominal pain, constipation, blindness, and death. Skin contact may cause irritation, rash, and skin discoloration. Prolonged or repeated exposure may cause adverse reproductive effects, damage to the unborn child, and damage to genetic material.

Immediate Medical Care/ Special Treatment: If exposed or concerned, get medical attention. Treat symptomatically.

5. FIREFIGHTING MEASURES

Suitable Extinguishing Media: Water spray, dry powder, alcohol resistant foam, carbon dioxide.

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream, as it may scatter and spread fire.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides, hydrochloric acid.

Specific Hazards: Highly flammable. Vapors may case flash fire or ignite explosively. Can be ignited easily by heat, sparks, or flames and burns vigorously. Material may burn with an invisible flame. Sealed containers may explode when heated or involved in fire. Material may be sensitive to static discharge. Vapors may travel considerable distance to source of ignition and flash back. Vapor from the solvent may accumulate in container headspace, resulting in flammability hazard. High vapor concentration in air may cause an explosion hazard. Excessive thermal conditions may cause decomposition and yield corrosive and/or toxic fumes.

Special Protective Equipment/ Precautions for Firefighters: As in any fire, wear MSHA/NIOSH-approved (or equivalent), self-contained, positive-pressure or pressure-demand breathing apparatus and full protective gear. Use water spray to cool unopened containers. Move containers from fire area, if you can do so without risk. This material may evaporate if spilled and leave a flammable residue. In the event of fire and/or explosion, do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions and Protective Equipment: Ventilate area of leak or spill. Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Keep out of low areas. Wear appropriate personal protective equipment (see Section 8). Remove all sources of ignition. Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. Avoid contact with eyes, skin, and clothing.

Emergency Procedures: Evacuate surrounding personnel as needed. In case of chemical emergency, or if unsure how to address an accidental release, consult a professional (see Section 1).

Methods for Containment: Eliminate all sources of ignition. Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements, or confined areas. Dike the spilled material, where this is possible. Product should not be released to the environment. Contain and recover waste when possible.

Methods for Cleanup: Absorb spill with an inert material (e.g. vermiculite, dry sand, earth, cloth, or fleece) and place in a noncombustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Residues from spills can be absorbed with alcohol or acetone. Never return spills in original containers for reuse. Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling: Do not handle, store, or open near an open flame, sources of heat, or sources of ignition. Wear personal protective equipment (see Section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work areas. Limit exposure to light. Avoid contact with skin, eyes, and clothing. Do not breathe vapors or spray mist. Do not ingest. When using, do not eat, drink, or smoke. Take precautionary measures against static discharge. To avoid ignition of vapors by static electricity discharge, all metal parts of equipment must be grounded. Keep away from incompatible materials (see Section 10). Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty, as they retain product residues. Observe all warnings and precautions listed for this product.

Storage: Store in a cool, dry, ventilated area. Store in a segregated and approved area away from incompatible materials (see Section 10). Store in original container. Keep containers tightly closed and upright. Keep out of light. Keep away from food, drink, and animal foodstuffs. Keep out of the reach of children. Ground container and transfer equipment. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of this product.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:	Ethanol:	ACGIH:	STEL:	1000 ppm
		OSHA:	PEL:	1000 ppm
				900 mg/m^3

Methanol:	ACGIH: TWA:	200 ppm
	STEL:	250 ppm
	BEL:	15 mg/L
	OSHA: PEL:	200 ppm
		260 mg/m^3
Isopropanol:	ACGIH: TWA:	200 ppm
	STEL:	400 ppm
	BEL:	40 mg/L
	OSHA: PEL:	400 ppm
		980 mg/m^3
Acetonitrile:	ACGIH: TWA:	20 ppm
	OSHA: TWA:	40 ppm
	STEL:	60 ppm
Petroleum Distillates:	ACGIH: TWA:	200 mg/m^3
	OSHA: TWA:	400 ppm
	STEL:	500 ppm
Dipropylene Glycol Butoxy Ether:	No information found.	
"Trade Secret":	No information found.	
Rhodamine 6G:	No information found.	
Basic Yellow 40:	No information found.	

Engineering Controls: Ensure adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Measures:

Eye/Face Protection: Wear safety glasses with side shields or safety goggles. Wear a face shield. Maintain approved eyewash station and accessible rinse facilities in work area.

Skin Protection: Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.

Respiratory Protection: An air-purifying, NIOSH-approved respirator with appropriate cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Use a positive-pressure, air-supplied respirator if there is any potential for an uncontrolled release, if exposure levels are unknown, or if any other circumstances exist where air-purifying respirators may not provide adequate protection.

Specific Requirements for Personal Protective Equipment: Ensure that glove material is compatible with this product. This information is available from glove manufacturers.

9. PHYSICAL AND CHEMICAL PROPERTIES

Unless otherwise indicated, all properties are given at 25 °C and standard pressure.

Appearance: Green-orange, fluorescent liquid.

Odor: Mild, characteristic.

Odor Threshold: No information found.

Formula Weight: Mixture.

pH:	No information found.
Melting/Freezing Point:	< 0 °C
Boiling Point/Range:	≥ 78.5 °C
Decomposition Temperature:	No information found.
Flash Point:	13.5 °C (estimated)
Auto-ignition Temperature:	No information found.
Flammability:	Explosive as vapor; flammable as liquid.
Flammability/Explosive Limits:	Lower: 3.3% by volume (estimated) Upper: 19% by volume (estimated)
Solubility:	Miscible with alcohol.
Vapor Pressure:	No information found.
Vapor Density:	No information found.
Specific Gravity:	0.788 (Water = 1)
Evaporation Rate:	No information found.
Viscosity:	No information found.
Partition Coefficient (n-octanol/water):	No information found.

10. STABILITY AND REACTIVITY

Reactivity Data:	Highly flammable. See Section 9.
Chemical Stability:	Stable under normal conditions. Sensitive to light.
Conditions to Avoid:	Heat, cold, flames, sparks, sources of ignition, excessive exposure to light, and incompatible materials.
Incompatible Materials:	Oxidizing agents, metals, halogens, isocyanates, inorganic salts, inorganic hydrides, organic materials, hydrazine, acid anhydrides, bases, acids.
Hazardous Decomposition Products:	Carbon oxides, nitrogen oxides, hydrochloric acid.
Possibility of Hazardous Reactions:	May react vigorously, violently, or explosively if exposed to extreme thermal conditions or in contact with the incompatible materials listed above.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure:	Inhalation, ingestion, skin contact, eye contact.
Acute Effects:	Harmful if swallowed, inhaled, or absorbed through the skin. May causes irritation to the eyes, skin, respiratory tract, and gastrointestinal tract. May cause visual disturbances or blindness if absorbed into the blood stream. May affect the blood, brain, urinary system, liver, spleen, eyes, kidneys, cardiovascular system, pancreas, and central nervous system.

Chronic Effects: Prolonged or repeated exposure may affect liver, kidneys, central nervous system, brain, cardiovascular system, blood, spleen, and heart; may cause adverse reproductive effects, birth defects, mutagenic effects, dermatitis, and damage to eyesight.

Toxicological Data:

Ethanol:	LD_{50} Oral, Rat:	7060 mg/kg
	LC_{50} Inhalation, Rat:	124.7 mg/L 4 h
Methanol:	LD_{50} Oral, Rat:	5628 mg/kg
	LD_{50} Dermal, Rabbit:	15,800 mg/kg
	LC_{50} Inhalation, Rat:	87.6 mg/L 6 h
	LDL Oral, Human:	143 mg/kg
	Toxic to reproduction based on animal data.	
Isopropanol:	LD_{50} Oral, Rat:	5045 mg/kg
	LD_{50} Dermal, Rabbit:	12,800 mg/kg
	LC_{50} Inhalation, Rat:	72.6 mg/L 4 h
Acetonitrile:	LD_{50} Oral, Rat:	2640 mg/kg
	LD_{50} Dermal, Rabbit:	2000 mg/kg
	LC_{50} Inhalation, Rat:	7661 mg/L 8 h
	Causes skin and eye irritation based on animal data.	
	May be toxic to reproduction based on animal data.	
	May be mutagenic based on animal data.	
Petroleum Distillates:	LD_{50} Oral, Rat:	5000 mg/kg
	Causes skin and eye irritation based on animal data.	
Dipropylene Glycol Butoxy Ether:	LD_{50} Oral, Rat:	1475-4400 mg/kg
	LD_{50} Dermal, Rabbit:	5340 mg/kg
	LC_{50} Inhalation, Rat:	2040 mg/L 4 h
"Trade Secret":	Causes skin and eye irritation based on animal data.	
Rhodamine 6G:	No information found.	
Basic Yellow 40:	No information found.	

Symptoms of Exposure: Irritation, rash, skin discoloration, unconsciousness, visual disturbances, metabolic acidosis, impaired judgment, impaired coordination, drowsiness, dizziness, headache, suffocation, shortness of breath, hoarseness, nervous system effects, cardiovascular effects, coughing, nausea, vomiting, diarrhea, abdominal pain, constipation, and blindness.

Carcinogenic Effects:

IARC:	Isopropanol:	Group 3 – Not classifiable as to its carcinogenicity to humans
	Rhodamine 6G:	Group 3 – Not classifiable as to its carcinogenicity to humans
ACGIH:	Isopropanol:	A4 – Not classifiable as a human carcinogen

12. ECOLOGICAL INFORMATION

Ecotoxicological Data:

Ethanol:		
	EC_{50}, Water Flea (Daphnia magna):	7.7 mg/L 48 h
	LC_{50}, Fathead Minnow (Pimephales promelas):	> 100 mg/L 96 h
Methanol:		
	EC_{50}, Water Flea (Daphnia magna):	> 10,000 mg/L 48 h
	LC_{50}, Fathead Minnow (Pimephales promelas):	> 100 mg/L 96 h

Isopropanol:
LC_{50}, Western Mosquitofish (Gambusia affinis): >1400 mg/L 96 h

Acetonitrile:
EC_{50}, Water Flea (Daphnia magna): 1640 mg/L 96 h

Petroleum Distillates:
No information found.

Dipropylene Glycol Butoxy Ether:
No information found.

"Trade Secret":
No information found.

Rhodamine 6G:
No information found.

Basic Yellow 40:
No information found.

Persistence and Degradability: Expected to be biodegradable.

Bioconcentration Factor: Methanol: 1.0

Environmental Effects: May be harmful to aquatic organisms. Avoid release to the environment.

13. DISPOSAL INFORMATION

Disposal Instructions: All wastes must be handled in accordance with local, state, and federal regulations. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or into sewers.

Contaminated Packaging: Because emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near product container. Offer rinsed packaging material to local recycling facilities.

Waste Codes:
Methanol: U154 (US RCRA Hazardous Waste U List – Ignitable Waste)
Acetonitrile: U003 (US RCRA Hazardous Waste U List – Ignitable Waste)

14. TRANSPORT INFORMATION

DOT:

UN Number: UN1987

Proper Shipping Name: Alcohols, n.o.s. (Denatured ethanol)

Hazard Class: 3

Packing Group: II

ERG Number: 127

Environmental Hazard Regulations: No information found.

Other Transport Precautions: IMDG Number: UN1987

DOT Reportable Quantity: Methanol: 5000 lb
Acetonitrile: 5000 lb

15. REGULATORY INFORMATION

U.S. Federal Regulations:

OSHA: This product is considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Inventory: All components of this product are on the U.S. TSCA Inventory.

U.S. EPCRA (SARA Title III):

Section 302: No information found.

Sections 311/312:

Hazard Category	List (Yes/No)
Section 311 – Hazardous Chemical	Yes
Immediate Hazard	Yes
Delayed Hazard	No
Fire Hazard	Yes
Pressure Hazard	No
Reactivity Hazard	No

Section 313: De Minimis Concentration: Methanol: 1.0%
Isopropyl Alcohol: 1.0%
Acetonitrile: 1.0%
Rhodamine 6G: 1.0%

CERCLA Reportable Quantities: Methanol: 5000 lb
Acetonitrile: 5000 lb

Canada WHMIS: This SDS is prepared in compliance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Therefore, it complies with the 2015 Workplace Hazardous Materials Information System (WHMIS) as well.

International Inventories:

Country or Region	Inventory Name	On Inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*A "Yes" indicates that the listed components of this product comply with the inventory requirements administered by the governing country or region.

16. OTHER INFORMATION

Disclaimer: Pioneer Forensics, LLC provides the information in this Safety Data Sheet in the belief that it is reliable but assumes no responsibility for its completeness or accuracy. The physical properties reported in this SDS are obtained from literature and do not constitute product specifications. Pioneer Forensics, LLC makes and gives no representations or warranties with respect to the information contained herein or the product to which it refers, whether express, implied, or statutory, including without limitation, warranties of accuracy, completeness, merchantability, non-infringement, performance, safety, suitability, stability, and fitness for a particular purpose. No warranty against infringement of any patent, copyright or trademark is made or implied. This SDS is intended only as a guide to the appropriate handling of the material by a properly trained person. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. Accordingly, Pioneer Forensics, LLC assumes no liability whatsoever for the use of or reliance upon this information including results obtained, incidental or consequential damages, or lost profits.

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