Pioneer Forensics LLC
VERITATEM PER EVIDENTIA
"Truth Through Evidence"

SDS

Safety Data Sheet

1. IDENTIFICATION

Product Identifier: **Ninhydrin Solution, Alcohol Formula**

Product Code(s): PF30036

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
4621 Technology Drive
Golden, CO 80403
Phone: (303) 762-0800

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

2. HAZARDS IDENTIFICATION

Hazard Classifications:

Eye Damage/Irritation:	Category 2A
Specific Target Organ Toxicity – Single Exposure:	Category 1
Flammable Liquids:	Category 2

Signal Word: DANGER

Hazard Statements:
Causes serious eye irritation.
Causes damage to organs.
Highly flammable liquid and vapor.

Pictograms:



Precautionary Statements:

Prevention:
Wash thoroughly after handling.
Wear protective gloves, eye protection, and face protection.

Do not breathe fume, mist, vapors, or spray.
Do not eat, drink or smoke when using this product.
Keep away from heat, sparks, open flames, and hot surfaces. – No smoking.
Keep container tightly closed.
Ground or bond 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 in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
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 toxic to humans. Primates are especially susceptible to the toxic effects of methanol, which are not reflected through toxicity data (see Section 11).
May cause adverse reproductive effects based on human and animal data.
May cause drowsiness or dizziness.
May accumulate static charge and cause flash fire hazard.
May cause aspiration hazard if vomited.

Toxicity Statement: Not applicable.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Component	Common Name / Synonyms	CAS#	Chemical Formula	% by Weight
Ninhydrin	1,2,3-Indantrione	485-47-2	$C_9H_6O_4$	0.789
Ethanol	Ethyl Alcohol	64-17-5	C_2H_6O	89.786
Methanol	Methyl Alcohol	67-56-1	CH_4O	4.464
Isopropanol	Isopropyl Alcohol	67-63-0	C_3H_8O	4.961

Trade Secret Statement: Not 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 poison center or doctor immediately if you feel unwell or are concerned.

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. If conscious, give 1-2 glasses of water.

Never give anything by mouth to an unconscious person. Call a poison center or doctor immediately if you feel unwell or are concerned.

Skin Contact: Immediately remove contaminated clothing and shoes. Wash skin with soap and plenty of water for at least 15 minutes. Wash clothing before reuse. Call a poison center or doctor immediately if you feel unwell or are concerned.

Eye Contact: Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Check for and remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor immediately if you feel unwell or are concerned.

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

Symptoms and Effects: Causes serious eye irritation. Causes damage to organs. May cause skin, gastrointestinal tract, and respiratory tract irritation. May cause skin dryness and redness. May be harmful if swallowed, inhaled, or exposed to the skin or eyes. Absorption through skin may cause visual disturbances, metabolic acidosis, drowsiness, and dizziness. Inhalation of vapors may cause drowsiness, dizziness, suffocation, shortness of breath, nervous system effects, cough, unconsciousness, and cardiovascular effects. May affect the blood, brain, urinary system, liver, kidneys, cardiovascular system, respiratory system, mucous membranes, brain, pancreas, spleen, and eyes. Ingestion may cause drowsiness, dizziness, nausea, vomiting, diarrhea, abdominal pain, constipation, nervous system effects, cardiovascular effects, visual disturbances, unconsciousness, blindness, and respiration effects. Prolonged or repeated exposure may cause liver, kidney, and central nervous system effects. Prolonged or repeated exposure may also cause adverse reproductive effects and dermatitis.

Immediate Medical Care/ Special Treatment: If you feel unwell or are concerned, call a poison center or doctor immediately. Treat symptomatically. Symptoms may be delayed.

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.

Specific Hazards: Highly flammable liquid and vapor. Vapors may cause flash fire or ignite explosively. Burns vigorously if ignited easily by heat, sparks, or flames. Material may burn with an invisible flame. Sealed containers may explode when heated or involved in fire. Material is 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 and leave a flammable residue if spilled. 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 discharge. 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: 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 possible. Product should not be released to the environment. Contain and recover liquid when possible.

Methods for Cleanup: Absorb spill with an inert material (e.g. vermiculite, dry sand, earth, cloth, or fleece) and place in a non-combustible container for reclamation or disposal. Do not flush to sewer. Clean contaminated surface thoroughly. Spills can be diluted with water. 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 the 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 (vapors, liquids). 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 heat, sources of ignition, and incompatible materials (see Section 10). Store in original container. Keep out of light. Keep containers tightly closed and upright. 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:

Ninhydrin:	No information found.		
Ethanol:	ACGIH:	STEL:	1000 ppm
	OSHA:	PEL:	1000 ppm
			1900 mg/m^3
	NIOSH:	TWA:	1000 ppm
			1900 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
	NIOSH:	REL:	400 ppm
		STEL:	500 ppm

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 goggles and a face shield. Maintain approved eye wash 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: Yellow, transparent liquid.

Odor: Pungent, alcoholic.

Odor Threshold: ≈ 84 ppm

Formula Weight: Mixture.

pH: No information found.

Melting/Freezing Point: ≈ -114 °C

Boiling Point/Range: ≈ 78.5 °C

Decomposition Temperature: No information found.

Flash Point: ≈ 13 °C

Auto-ignition Temperature: ≈ 362 °C

Flammability: Explosive as vapor; flammable as liquid.

Flammability/Explosive Limits:	Lower: ≈ 3.3% by volume Upper: ≈ 19% by volume
Solubility:	Miscible with water, alcohol.
Vapor Pressure:	≈ 43.5 mmHg @ 20 °C
Vapor Density:	≈ 1.6 (Air = 1)
Specific Gravity:	≈ 0.79 (Water = 1)
Evaporation Rate:	≈ 49 (Butyl Acetate = 1)
Viscosity:	No information found.
Partition Coefficient (n-octanol/water):	No information found.

10. STABILITY AND REACTIVITY

Reactivity Data:	Highly flammable liquid and vapor. See Section 9.
Chemical Stability:	Stable under normal conditions.
Conditions to Avoid:	Heat, flames, sparks, sources of ignition, direct sunlight, incompatible materials, extremes of temperature.
Incompatible Materials:	Oxidizers, metals, halogens, isocyanates, inorganic salts, inorganic hydrides, organic materials, hydrazine, acid anhydrides, bases, acids, ammonia, reducing agents.
Hazardous Decomposition Products:	Carbon oxides.
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. Exposure to excessive thermal conditions or incompatible materials may yield hazardous decomposition products listed above.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure:	Inhalation, ingestion, skin contact, eye contact.		
Acute Effects:	Causes serious eye irritation. Causes damage to organs. May cause skin, gastrointestinal tract, and respiratory tract irritation. May cause skin dryness and redness. May be harmful if swallowed, inhaled, or exposed to the skin or eyes. May affect the blood, brain, urinary system, liver, kidneys, cardiovascular system, respiratory system, mucous membranes, brain, pancreas, spleen, and eyes.		
Chronic Effects:	Prolonged or repeated exposure may cause liver, kidney, and central nervous system effects. Prolonged or repeated exposure may also cause adverse reproductive effects and dermatitis.		
Toxicological Data:	Ninhydrin:	LD_{50} Oral, Rat:	600 mg/kg
	Ethanol:	LD_{50} Oral, Rat:	7060 mg/kg
		LC50 Inhalation, Rat:	124.7 mg/L 4 h
		Causes moderate eye irritation based on animal data.	

Methanol:	LD_{50} Oral, Rat:	5628 mg/kg
	LC_{50} Inhalation, Rat:	87.5 mg/L 6 h
	LD_{50} Dermal, Rabbit:	15,800 mg/kg
	LD_{Lo} Oral, Human:	143 mg/kg
	Toxic to reproduction based on animal data.	
Isopropanol:	LD_{50} Oral, Rat:	5045 mg/kg
	LC_{50} Inhalation, Rat:	72.6 mg/L 4 h
	LD_{50} Dermal, Rabbit:	12,800 mg/kg
	Causes mild skin irritation based on animal data.	
	Causes moderate eye irritation based on animal data.	

Symptoms of Exposure: Absorption through skin may cause visual disturbances, metabolic acidosis, drowsiness, and dizziness. Inhalation of vapors may cause drowsiness, dizziness, suffocation, shortness of breath, nervous system effects, cough, unconsciousness, and cardiovascular effects. Ingestion may cause drowsiness, dizziness, nausea, vomiting, diarrhea, abdominal pain, constipation, nervous system effects, cardiovascular effects, visual disturbances, unconsciousness, blindness, and respiration effects.

Carcinogenic Effects: No component of this product is considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

ACGIH: Isopropanol: A4 – Not classifiable as a human carcinogen

IARC: Isopropanol: 3 – Not classifiable to humans

12. ECOLOGICAL INFORMATION

Ecotoxicological Data:

Ninhydrin:
No information found.

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):	> 1,400 mg/L 96 h
LC_{50}, Fathead Minnow (Pimephales promelas):	9,640 mg/L 96 h

Persistence and Degradability: Expected to be readily biodegradable.

Bioconcentration Factor: Methanol: 1.0

Bioaccumulation Factor: Isopropanol: 3.16

Environmental Effects: May be hazardous to the aquatic environment.

13. DISPOSAL INFORMATION

Disposal Instructions: Dispose of this material and its container to an approved waste collection point. Minimize exposure to product waste (see Section 8). Do not dispose unused waste down drains or

into sewers. All wastes must be handled in accordance with local, state, and federal regulations.

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)

Isopropanol: D001: Waste flammable material (with a flash point < 140 °F)

14. TRANSPORT INFORMATION

DOT:

UN Number: UN1987

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

Hazard Class: 3

Packaging Group: II

ERG Number: 127

Environmental Hazard Regulations: No information found.

Other Transport Precautions: IMDG Number: UN1987

Reportable Quantity: Methanol: 5,000 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	Yes
Fire Hazard	Yes
Pressure Hazard	No
Reactivity Hazard	No

Section 313: Isopropanol, Methanol: De Minimis Concentration: 1.0%

CERCLA Reportable Quantities: Methanol: 5,000 lb

International Inventories:

Country or Region	Inventory Name	On Inventory (Yes/No)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
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)	Yes
Korea	Existing Chemicals List (ECL)	Yes
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

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Reason for Revision: Not applicable.