SAFETY DATA SHEET

Cat# BN00957, Aldehyde Dehydrogenase Activity Fluorometric Assay Kit

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Aldehyde Dehydrogenase Activity Fluorometric Assay Kit**

PRODUCT CODES: **Cat# BN00957**

MANUFACTURER: **Assay Genie (brand of Reagent Genie Ltd.)**

ADDRESS: **G1 The Steelworks, Foley Street, Dublin 1**

EMERGENCY PHONE: **+353 1 8879802**

SECTION 2: HAZARDS IDENTIFICATION

Component	Description	Volume	Safety Information
ALDH Assay Buffer	Proprietary Buffer	25 ml	No hazards
Acetaldehyde	Solution	0.5 ml	See below
GenieProbe	In DMSO	0.4 ml	See below
ALDH Substrate Mix	Lyophilized	1 vial	No hazards
ALDH Positive Control	Lyophilized	1 vial	No hazards
NADH Standard (0.5 µmol)	Lyophilized	1 vial	No hazards

Acetaldehyde:

Emergency Overview

OSHA Hazards: Flammable liquid, Carcinogen, Target organ effect, Harmful by ingestion, Skin sensitizer, Irritant

Target Organs: Blood, Kidney, Lungs, Cardiovascular system, Liver, Central nervous system

GHS Classification:
Flammable liquids (Category 1)
Acute toxicity, Oral (Category 4)
Acute toxicity, Inhalation (Category 5)
Acute toxicity, Dermal (Category 5)
Skin irritation (Category 3)
Eye irritation (Category 2A)
Skin sensitization (Category 1)
Carcinogenicity (Category 2)
Specific target organ toxicity – single exposure (Category 3)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram:

Signal word: Danger

Hazard statement(s):
H224 Extremely flammable liquid and vapour.
H302 Harmful if swallowed.
H313+H333 May be harmful in contact with skin or if inhaled.
H316 Causes mild skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.
H402 Harmful to aquatic life.

Precautionary statement(s): P210 Keep away from heat/sparks/open flames/hot surfaces – no smoking.
P261 Avoid breathing dust/fumes/gas/mist/vapors/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification
- **Health hazard**: 2
- **Chronic health hazard**: *
- **Flammability**: 4
- **Physical hazards**: 2

NFPA Rating
- **Health Hazard:** 2
- **Fire**: 4

Reactivity Hazard: 0

Potential Health Effects

Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
Skin: Harmful if absorbed through skin. Causes skin irritation.
Eyes: Causes eye irritation.
Ingestion: Harmful if swallowed.

DMSO:

Emergency Overview
OSHA Hazards: Combustible liquid, Target organ effect
Target Organs: Eyes, Skin
GHS Classification: Flammable liquids (Category 4)
GHS Label elements, including precautionary statements
Pictogram: none
Signal word: Warning
Hazard statement(s): H227 Combustible liquid
Precautionary statement(s): none
HMIS Classification
Health hazard: 0
Chronic Health Hazard: *
Flammability: 2
Physical hazards: 0
NFPA Rating
Health hazard: 0
Fire: 2
Reactivity Hazard: 0
Potential Health Effects
Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
Skin: May be harmful if absorbed through skin. May cause skin irritation.
Eyes: May cause eye irritation.
Ingestion: May be harmful if swallowed.
Aggravated Medical Condition: Avoid contact w/DMSO solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through the skin and may carry such materials into the body.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	EC-No.	Molecular Weight	Chemical Formula
Acetaldehyde	75-07-0	200-836-8	44.05	C_2H_4O
DMSO	67-68-5	200-664-3	78.13	C_2H_6OS

SECTION 4: FIRST AID MEASURES

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
If inhaled: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact: Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.
In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

SECTION 5: FIRE-FIGHTING MEASURES

Acetaldehyde:

Conditions of flammability: Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.
Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Specific hazards arising from the chemical: May explode when heated. Closed containers may rupture and explode during runaway polymerization. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.
Hazardous combustion products: Hazardous decomposition products formed under fire conditions – see section 10.
Further information: Use water spray to cool unopened containers.

DMSO:

Suitable extinguishing media: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.
Special protective equipment for firefighters: Wear self-contained breathing apparatus for firefighting if necessary.
Hazardous combustion products: Hazardous combustion products formed under fire conditions – no data available.

Further information: Use water spray to cool unopened containers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.
Methods for cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Recommended storage temperature: -20 °C

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Acetaldehyde:

Components	CAS-No.	Value	Control parameters	Basis
Acetaldehyde	75-07-0	C	25 ppm	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
Remarks:	Upper respiratory tract irritation. Confirmed animal carcinogen with unknown relevance to humans.			
		TWA	100 ppm 180 mg/m^3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		STEL	150 ppm 270 mg/m^3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
	See Appendix D – Substances with no established RELs			

DMSO:

Components	CAS-No.	Value	Control parameters	Basis
Dimethyl sulfoxide	67-68-5	TWA	250 ppm	USA. Workplace Environmental Exposure Levels (WEEL)

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Eye protection

Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Property	Acetaldehyde	DMSO
Appearance:	Clear liquid	Clear liquid
pH:	5 at 20 °C (68 °F)	No data available
Water Solubility:	Completely miscible	Completely miscible

Other Solubility:	No data available	No data available
Boiling Point (°C):	21 °C (70 °F)	189 °C (372 °F)
Melting Point (°C):	-125 °C (-193 °F)	16-19 °C (61-66 °F)
Flash Point (°C):	-40 °C (-40 °F)	87 °C (189 °F)
Ignition Temperature (°C):	175 °C (347 °F)	301 °C (574 °F)
Density:	0.785 g/ml	1.1 g/ml

SECTION 10: STABILITY AND REACTIVITY

Property	Acetaldehyde	DMSO
Chemical stability:	Avoid exposure to air, any longer than necessary so as to prevent peroxide formation.	Stable under recommended storage conditions
Conditions to avoid:	Air, heat, flames, & sparks. Extremes of temperature and direct sunlight.	Heat, flames, sparks
Materials to avoid:	Oxidizing agents, reducing agents, acids, nitric acid, peroxides, bases, sodium hydroxide, amines, ammonia, oxygen. Warning: acetaldehyde is oxidized rapidly and exothermically by air, to acetic acid, acid anhydrides, alcohols, halogens, ketones, phenol, hydrogen sulfide gas, hydrogen peroxide	Acid chlorides, phosphorus halides, strong acids, strong oxidizing agents, strong reducing agents
Hazardous decomposition products:	Carbon oxides	Carbon oxides, sulfur oxides

SECTION 11: TOXICOLOGICAL INFORMATION

Acetaldehyde:
Acute toxicity: LD50 Oral – rat – 661 mg/kg Remarks: Peripheral Nerve & Sensation: spastic paralysis with or without sensory change. Behavioral: altered sleep time (including change in righting reflex). Lungs, Thorax, or Respiration: dyspnea.
LC50 Inhalation – rat – 4 h – 13300 ppm Remarks: Behavioral: excitement. Lung, Thorax, or Respiration: dyspnea.
LD50 Dermal – rabbit – 3,540 mg/kg
Skin corrosion/irritation: Skin – rabbit – mild skin irritation
Serious eye damage/eye irritation: no data available
Respiratory or skin sensitization: May cause allergic skin reactions. Photosensitizer.
Germ cell mutagenicity: Laboratory experiments have shown mutagenic effects.
Carcinogenicity: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification. Limited evidence of carcinogenicity in animal studies.

- IARC: 2B – Group 2B: Possibly carcinogenic to humans (Acetaldehyde)
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: Reasonably anticipated to be a human carcinogen (Acetaldehyde)
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available
Teratogenicity: no data available
Specific target organ toxicity – single exposure (GHS): Inhalation – may cause respiratory irritation.
Specific target organ toxicity – repeated exposure (GHS): no data available
Aspiration hazard: no data available
Potential Health Effects

- **Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation.
- **Skin:** Harmful if absorbed through skin. Causes skin irritation.
- **Eyes:** Causes eye irritation.
- **Ingestion:** Harmful if swallowed.

Signs and Symptoms of Exposure: Exposure may cause blurred vision, unconsciousness, headache, vomiting, nausea, pulmonary edema. Effects may be delayed. Convulsions, sneezing, cough, shortness of breath.
Synergistic effects: no data available
Additional information: RTECS: AB1925000

DMSO:
Acute toxicity: LD50 Oral - rat - 14,500 mg/kg
LC50 Inhalation - rat - 4 h - 40250 ppm
LD50 Dermal - rabbit - > 5,000 mg/kg
Skin corrosion/irritation: no data available
Serious eye damage/eye irritation: no data available

Respiratory/skin sensitization: no data available
Germ cell mutagenicity: Genotoxicity in vitro - mouse – lymphocyte Cytogenetic analysis
Genotoxicity in vitro - mouse – lymphocyte Mutation in mammalian somatic cells.
Genotoxicity in vivo - rat – Intraperitoneal Cytogenetic analysis
Genotoxicity in vivo - mouse – Intraperitoneal DNA damage
Carcinogenicty: Carcinogenicity – rat – Oral Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Skin & Appendages: Other: Tumors.
Carcinogenicty – mouse – Oral Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Leukaemia Skin & Appendages: Other: Tumors.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Reproductive toxicity – rat – Intraperitoneal Effects on Fertility: Abortion.
Reproductive toxicity – rat – Intraperitoneal Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Reproductive toxicity – rat – Subcutaneous Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).
Reproductive toxicity –mouse – Oral Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.
Teratogenicity: Developmental Toxicity – mouse – Intraperitoneal Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.
Signs and Symptoms of Exposure: Exposure via ingestion may cause nausea, fatigue, headache.
Additional Information: RTECS: PV6210000

SECTION 12: ECOLOGICAL INFORMATION

Acetaldehyde:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: LC50 – Pimephales promelas (Fathead minnow) – 31 mg/l – 96 h
LC100 – Leuciscus idus (Golden orfe) – 124-156 mg/l – 48 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia magna (Water flea) – 48 mg/l – 48 h
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

DMSO:
Persistence and degradability: no data available
Toxicity: Toxicity to fish: LC50 – Pimephales promelas (fathead minnow) – 34,000 mg/l – 96 h
LC50 – Oncorhynchus mykiss (rainbow trout) – 35,000 mg/l – 96 h
Toxicity to daphnia and other aquatic invertebrates: EC50 – Daphnia pulex (Water flea) – 27,500 mg/l
Toxicity to algae: EC50 – Lepomis macrochirus (Bluegill) – >400,000 mg/l – 96 h
Bioaccumulative potential: no data available
Mobility in soil: no data available
PBT and vPvB assessment: no data available
Other adverse effects: no data available

SECTION 13: DISPOSAL CONSIDERATIONS

Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
Contaminated packaging: Dispose of as unused product.

SECTION 14: TRANSPORT INFORMATION

Acetaldehyde:
DOT (US): UN-Number: 1089, Class: 3, Packing group: I; Proper shipping name: Acetaldehyde; Reportable Quantity (RQ): 1000 lbs.; Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: UN-Number: 1089, Class: 3, Packing group: I; EMS-No: F-E, S-D; Proper shipping name: ACETALDEHYDE; Marine pollutant: No

IATA: UN-Number: 1089, Class: 3, Packing group: I; Proper shipping name: Acetaldehyde; IATA Passenger: Not permitted for transport

DMSO:
DOT (US): UN-Number: 1993, Class: CBL, Packing group: III; Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide); Marine pollutant: No; Poison Inhalation Hazard: No
IMDG: Not dangerous goods.
IATA: Not dangerous goods.

SECTION 15: REGULATORY INFORMATION

OSHA Hazards: Acetaldehyde: Flammable liquid, Carcinogen, Target organ effect, Harmful by ingestion, Skin sensitizer, Irritant
DMSO: Combustible liquid, Target organ effect
SARA 302 Components: SARA 302: No chemical in this material are subject to the reporting requirements of SARA Title III, Section 302.
SARA 313 Components: The following components are subject to reporting levels established by SARA Title III, Section 313:
Acetaldehyde, CAS- No. 75-07-0; Revision Date: 2007-07-01
SARA 311/312 Hazards: Acetaldehyde: Fire Hazard, Acute Health Hazard, Chronic Health Hazard
DMSO: Fire Hazard, Chronic Health Hazard
Massachusetts Right To Know Components: Acetaldehyde, CAS- No. 75-07-0; Revision Date: 2007-07-01
Pennsylvania Right To Know Components: Acetaldehyde, CAS- No. 75-07-0; Revision Date: 2007-07-01
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01
New Jersey Right To Know Components: Acetaldehyde, CAS- No. 75-07-0; Revision Date: 2007-07-01
Dimethyl sulfoxide CAS-No. 67-68-5; Revision Date: 2007-03-01
California Prop. 65 Components: WARNING! This product contains a chemical known to the State of California to cause cancer:
Acetaldehyde, CAS- No. 75-07-0; Revision Date: 2007-09-28

EU regulations

Component	Risk Phrases	Safety Phrases
Acetaldehyde	R12, R36/37, R40	S16, S33, S36/37
DMSO	R10, R36/37/38	S24/25, S36/37/39, S45

SECTION 16: OTHER INFORMATION

DISCLAIMER:
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Assay Genie shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.