



Safety Data Sheet (SDS) According to the OSHA Hazard Communication Standard 29 CFR 1910.1200

Issuing Date: 2017-10-17

Revision Date: 2022-11-21

Version: 4

SECTION 1. Identification

Product identifier

Product No	9860
Product name	Senescence beta-Galactosidase Staining Kit
Kit Component	11674: 10X Fixative Solution 11675: 10X Staining Solution 11676: 100X Solution A 11677: 100X Solution B 11678: X-Gal
UN number	UN3334

Recommended use of the chemical and restrictions on use

Identified uses This product is intended for research purposes only.

Manufacturer, importer, supplier

Manufacturer address	Cell Signaling Technology, Inc. 3 Trask Lane Danvers, MA 01923 United States TEL: +1 978 867 2300 FAX: +1 978 867 2400
Website	www.cellsignal.com
Email address	support@cellsignal.com
Emergency telephone number	In case of emergency call CHEMTREC 1-800-424-9300

SECTION 2. Hazard(s) identification

Classification

Classification and label elements described below are inclusive of all hazards of the combined kit. The most severe classifications are listed for each endpoint. Refer to individual kit component SDS for classification and label elements for each component

present in the kit.

This substance/mixture is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute oral toxicity	Category 4
Acute dermal toxicity	Category 4
Acute inhalation toxicity	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Respiratory sensitization	Category 1
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 1A
Specific target organ toxicity - single exposure (STOT SE)	Category 3

GHS Label elements, including precautionary statements



Signal Word

Danger.

Hazard statement(s)

Harmful if swallowed.
Harmful in contact with skin.
Harmful if inhaled.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Suspected of causing genetic defects.
May cause cancer.

Precautionary Statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use only outdoors or in a well-ventilated area.
Wash face, hands and any exposed skin thoroughly after handling.
In case of inadequate ventilation wear respiratory protection.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.
Avoid breathing dust/fume/gas/mist/vapors/spray.
Avoid release to the environment.
IF exposed or concerned: Get medical advice/attention

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.

IF ON SKIN: Wash with plenty of soap and water.

Take off immediately all contaminated clothing and wash it before reuse.

Call a POISON CENTER or doctor/physician if you feel unwell.

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 advice/attention

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

Dispose of contents/container to an approved waste disposal plant.

Supplementary Hazard Information

Hazards not otherwise classified (HNOC)

Not applicable.

SECTION 3. Composition/information on ingredients

Kit Component 11674: 10X Fixative Solution

Chemical name	CAS No	Weight-%
formaldehyde (stabilised)	50-00-0	10-25
glutaraldehyde	111-30-8	1-5

Formaldehyde has been classified by the International Agency for Research on Cancer (IARC) as a Known Human Carcinogen (Group 1)

Kit Component 11675: 10X Staining Solution

Chemical name	CAS No	Weight-%
trisodium orthophosphate	7601-54-9	<5
citric acid	77-92-9	<5

Kit Component 11676: 100X Solution A

Chemical name	CAS No	Weight-%
tetrapotassium iron (2+) hexacyanide trihydrate	14459-95-1	10-15

Contains a known or suspected endocrine disruptor

Kit Component 11677: 100X Solution B

Chemical name	CAS No	Weight-%
tripotassium hexacyanoferrate	13746-66-2	5-<10

Contains a known or suspected endocrine disruptor

Kit Component 11678: X-Gal

Chemical name	CAS No	Weight-%
5-bromo-4-chloroindol-3-yl-beta-D-galactopyranoside	7240-90-6	100

SECTION 4. First-aid measures

Eye contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Skin contact	Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. May cause an allergic skin reaction. If symptoms persist, call a physician.
Inhalation	Move to fresh air. Call a doctor if you feel unwell.
Ingestion	Rinse mouth. Drink plenty of water. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice. If swallowed, call a poison control center or doctor immediately.

Most important symptoms and effects, both acute and delayed

Contains kit components which may cause the following effects, refer to individual component SDSs for full information on symptoms. Low-dose acute exposure can result in headache, rhinitis, and dyspnea; higher doses may cause severe mucous membrane irritation, burning, and lacrimation, and lower respiratory effects such as bronchitis, pulmonary edema, or pneumonia. Sensitive individuals may experience asthma and dermatitis, even at very low doses. Ocular exposure to formaldehyde vapors produces irritation and lacrimation. Depending on the concentration, formaldehyde solutions may cause transient discomfort and irritation or more severe effects, including corneal opacification and loss of vision. Formaldehyde is absorbed through intact skin and may cause irritation or allergic dermatitis. Ingestion may cause corrosive injury to the gastrointestinal mucosa, with nausea, vomiting, pain, bleeding, and perforation. Systemic effects include metabolic acidosis, CNS depression and coma, respiratory distress, and renal failure.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Advice for emergency responders

General advice	For further assistance, contact your local Poison Control Center.
Protection of first-aiders	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

SECTION 5. Fire-fighting measures**Extinguishing media**

Suitable Extinguishing Media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Carbon dioxide (CO ₂). Water spray. Dry chemical. Alcohol-resistant foam.
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Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

Hazardous Combustion Products	Carbon oxides (CO _x).
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Explosion Data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	Evacuate personnel to safe areas. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Wear protective gloves/clothing and eye/face protection. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not touch or walk through spilled material. Wash thoroughly after handling. Avoid breathing vapors or mists. Ensure that there is no remaining risk before resuming normal operations.
Other information	No information available.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

Methods and material for containment and cleaning up

Methods for containment	Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Dam up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Pick up and transfer to properly labeled containers. Clean contaminated surface thoroughly. Avoid dust formation.

SECTION 7. Handling and storage

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Use according to package label instructions. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. In case of insufficient ventilation, wear suitable respiratory equipment. Remove and wash contaminated clothing before re-use. Avoid dust formation in confined areas. Ensure adequate ventilation. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions	Keep container tightly closed in a dry and well-ventilated place. Keep in properly labeled containers.
Packaging material	No information available.
Incompatible products	Strong oxidizing agents, strong acids, and strong bases.

SECTION 8. Exposure controls/personal protection

Control parameters

Occupational exposure limit values			
Chemical name	ACGIH TLV	OSHA PEL	NIOSH REL
formaldehyde (stabilised)	Ceiling: 0.3 ppm	TWA : 0.75 ppm STEL: 2 ppm	IDLH : 20 ppm TWA : 0.016 ppm Ceiling: 0.1 ppm
tetrapotassium iron (2+) hexacyanide trihydrate	TWA : 1 mg/m ³	TWA : 5 mg/m ³ S*	IDLH : 25 mg/m ³ TWA : 1 mg/m ³
tripotassium hexacyanoferrate	TWA : 1 mg/m ³	TWA : 5 mg/m ³ S*	IDLH : 25 mg/m ³ TWA : 1 mg/m ³
glutaraldehyde	Ceiling: 0.05 ppm	-	Ceiling: 0.2 ppm Ceiling: 0.8 mg/m ³

Appropriate engineering controls

Showers, eyewash stations, and ventilation systems.

Individual protection measures, such as personal protective equipment

Personal protective equipment (PPE) needs to be selected depending on the implemented engineering controls, frequency/duration of work activities and the concentrations of the hazardous substance.

Eye/face protection

Tightly fitting safety goggles. Face-shield.

Skin and body protection

Wear protective gloves/clothing.

Respiratory protection

If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

Hygiene measures

Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use.

SECTION 9. Physical and chemical properties

Information on the known physical chemical properties of each component within Kit are given below. If not included, information is either not available or not applicable. Refer to individual kit component SDS for further information.

Information on basic physical and chemical properties**Kit Component**

Physical state

Appearance

Color

Odor

pH VALUE

11674: 10X Fixative Solution

Liquid

Clear

Light yellow

Pungent, 0.83 ppm

5.8 (20°C)

Kit Component

Physical state

Appearance

Color

pH VALUE

11675: 10X Staining Solution

Liquid

Clear

Colorless

5.8 (20 °C)

Kit Component	11676: 100X Solution A
Physical state	Liquid
Appearance	Clear
Color	Yellow
pH VALUE	9.13 (20 °C)

Kit Component	11677: 100X Solution B
Physical state	Liquid
Appearance	Clear
Color	Orange
pH VALUE	5.75 (20 °C)

Kit Component	11678: X-Gal
Physical state	Solid
Appearance	Powder
Color	White
Melting point (°C) VALUE	230

SECTION 10. Stability and reactivity

Reactivity

No information available.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Hazardous reactions	None under normal processing.
Hazardous polymerization	None under normal processing.

Conditions to Avoid

Extremes of temperature and direct sunlight. Exposure to air or moisture over prolonged periods.

Incompatible Materials

Strong oxidizing agents, strong acids, and strong bases.

Hazardous Decomposition Products

Thermal decomposition can lead to release of irritating and toxic gases and vapors.

SECTION 11. Toxicological information

Information on likely routes of exposure

Product Information

Refer to kit component SDS for full toxicological information. This material should only be handled by, or under the close supervision of, those properly qualified in the handling and use of potentially hazardous chemicals. It should be borne in mind that the toxicological and physiological properties of this compound is not well defined.

Inhalation

Kit Component
Inhalation

11674: 10X Fixative Solution

May cause irritation of respiratory tract. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause drowsiness and dizziness.

Eye contact

Kit Component
Eye contact

11674: 10X Fixative Solution

Corrosive to the eyes and may cause severe damage including blindness.

Kit Component
Eye contact

11675: 10X Staining Solution

May cause slight irritation.

Kit Component
Eye contact

11677: 100X Solution B

May cause slight irritation.

Skin contact

Kit Component
Skin contact

11674: 10X Fixative Solution

Irritating to skin. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

Kit Component
Skin contact

11675: 10X Staining Solution

May cause irritation.

Kit Component
Skin contact

11677: 100X Solution B

May cause slight irritation after prolonged contact with skin.

Ingestion

Kit Component
Ingestion

11674: 10X Fixative Solution

May be harmful if swallowed. May cause drowsiness or dizziness. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Information on toxicological effects

Kit Component
ATEmix (oral)
ATEmix (dermal)

11674: 10X Fixative Solution

420 mg/kg

984 mg/kg

ATEmix (inhalation-dust/mist) 1.1 mg/L
 ATEmix (inhalation-vapor) 5.00 mg/L

Component Information

Chemical name	LD50 Oral	LD50 Dermal	LC50 Inhalation
formaldehyde (stabilised)	= 100 mg/kg (Rat)	= 270 mg/kg (Rabbit)	= 0.578 mg/L (Rat) 4 h
tetrapotassium iron (2+) hexacyanide trihydrate	3613 mg/kg (Rat)	-	-
tripotassium hexacyanoferrate	2970 mg/kg (Mouse)	-	-
trisodium orthophosphate	>2000 mg/kg (Rat)	>2000 mg/kg (Rabbit)	-
citric acid	3000 mg/kg (Rat)	-	-
glutaraldehyde	134 mg/kg (Rat)	> 2000 mg/kg (Rat)	0.48 mg/L (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure**Symptoms**

Contains kit components which may cause the following effects, refer to individual component SDSs for full information on symptoms. Low-dose acute exposure can result in headache, rhinitis, and dyspnea; higher doses may cause severe mucous membrane irritation, burning, and lacrimation, and lower respiratory effects such as bronchitis, pulmonary edema, or pneumonia. Sensitive individuals may experience asthma and dermatitis, even at very low doses. Ocular exposure to formaldehyde vapors produces irritation and lacrimation. Depending on the concentration, formaldehyde solutions may cause transient discomfort and irritation or more severe effects, including corneal opacification and loss of vision. Formaldehyde is absorbed through intact skin and may cause irritation or allergic dermatitis. Ingestion may cause corrosive injury to the gastrointestinal mucosa, with nausea, vomiting, pain, bleeding, and perforation. Systemic effects include metabolic acidosis, CNS depression and coma, respiratory distress, and renal failure.

Skin and Eye Corrosion/Irritation

Kit Component 11674: 10X Fixative Solution
 Serious eye damage/eye irritation Causes serious eye irritation
 Skin corrosion/irritation Irritating to skin

Sensitization

Kit Component 11674: 10X Fixative Solution
 Respiratory Sensitization May cause allergy or asthma symptoms or breathing difficulties if inhaled
 Skin Sensitization May cause skin sensitization

Mutagenic effects

Kit Component 11674: 10X Fixative Solution
 Mutagenic effects No specific testing was done on this product. Mutagenic testing of the hazardous ingredient in this product has resulted in some positive mutagenic results

Carcinogenicity**Kit Component**

Carcinogenicity

11674: 10X Fixative Solution

Contains a known or suspected carcinogen. The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	IARC	NTP	OSHA
formaldehyde (stabilised) 50-00-0	1	Known	X

IARC: (International Agency for Research on Cancer) *Group 1 - Carcinogenic to Humans*

NTP: (National Toxicity Program) *Known - Known Carcinogen*

OSHA: (Occupational Safety & Health Administration) *X - Present*

Reproductive toxicity**Kit Component**

Reproductive toxicity

11674: 10X Fixative Solution

There is limited evidence that formaldehyde causes adverse reproductive effects. Formaldehyde has not been proven to be teratogenic in animals and is probably not a human teratogen at occupationally permissible levels

Systemic Target Organ Toxicity (STOT)**Kit Component**

STOT - single exposure
Target Organ Effects

11674: 10X Fixative Solution

May cause damage to organs.
Eyes, Respiratory system, Central nervous system (CNS), Blood, Kidney, Nasal Cavities, Nasal Septum, Bone marrow

Aspiration Hazard

No information available.

SECTION 12. Ecological information**Ecotoxicity****Component Information**

Chemical name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
formaldehyde (stabilised)	-	LC50 22.6 - 25.7 mg/L (Pimephales promelas) 96 h LC50 1510 µg/L (Lepomis macrochirus) 96 h LC50 23.2 - 29.7 mg/L (Pimephales promelas) 96 h LC50 0.032 - 0.226 mL/L (Oncorhynchus mykiss) 96 h LC50 100 - 136 mg/L (Oncorhynchus mykiss) 96 h LC50 41 mg/L (Brachydanio rerio) 96 h	EC50 11.3 - 18 mg/L (Daphnia magna) 48 h LC50 2 mg/L (Daphnia magna) 48 h
tetrapotassium iron (2+) hexacyanide trihydrate	-	LC50 19 mg/L (Poecilia reticulata) 96 h	EC50 32 mg/L (Daphnia) 48 h

tripotassium hexacyanoferrate	-	LC50 869 mg/l (Oncorhynchus mykiss) 96 h	EC50 549 mg/l (Daphnia magna) 48 h
trisodium orthophosphate	-	LC50 28.5 mg/L (Gambusia affinis) 96 h	-
citric acid	-	LC50 1516 mg/L (Lepomis macrochirus) 96 h	EC50 120 mg/L (Daphnia magna) 72 h
glutaraldehyde	EC50 0.61 mg/L (Desmodesmus subspicatus) 72 h	LC50 2.6 - 4.8 mg/L (Oncorhynchus mykiss) 96 h	EC50 0.56 - 1.0 mg/L (Daphnia magna) 48 h

Persistence and degradability

Kit Component	11674: 10X Fixative Solution
Persistence and degradability	Product is biodegradable
Kit Component	11675: 10X Staining Solution
Persistence and degradability	Readily biodegradable
Kit Component	11676: 100X Solution A
Persistence and degradability	For tetrapotassium iron (2+) hexacyanide trihydrate : Not readily biodegradable

Bioaccumulation

Kit Component	11674: 10X Fixative Solution
Bioaccumulation	Not likely to bioaccumulate
Kit Component	11675: 10X Staining Solution
Bioaccumulation	Not likely to bioaccumulate

Chemical name	Octanol-Water Partition Coefficient
formaldehyde (stabilised)	0.35
citric acid	-1.72
glutaraldehyde	0.22

Mobility

Kit Component	11674: 10X Fixative Solution
Mobility	Will likely be mobile in the environment due to its water solubility
Kit Component	11675: 10X Staining Solution
Mobility	Mobility in soil

Other adverse effects

No information available.

SECTION 13. Disposal considerations

Waste Disposal Methods

Should not be released into the environment. Dispose of in accordance with local regulations.

Disposal considerations

Do not empty into drains. This material and its container must be disposed of as hazardous waste. Dispose of wastes in an approved waste disposal facility.

SECTION 14. Transport information
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This material is subject to regulation as a hazardous material for shipping:

DOT

UN number	UN3334
UN proper shipping name	Aviation regulated liquid, n.o.s. (formaldehyde)
Transport hazard class(es)	9
Packing group	III

IATA

UN number	UN3334
UN proper shipping name	Aviation regulated liquid, n.o.s. (formaldehyde)
Transport hazard class(es)	9
Packing group	III
Excepted Quantity	E1

SECTION 15. Regulatory information

North American Inventory Listing

Chemical name	TSCA 8(b)	TSCA 12(b)	DSL	NDSL
5-bromo-4-chloroindol-3-yl-beta-D-galactopyranoside	Not Listed	Not Listed	Listed	Not Listed
formaldehyde (stabilised)	Listed	Not Listed	Listed	Not Listed
tetrapotassium iron (2+) hexacyanide trihydrate	Not Listed	Not Listed	Not Listed	Not Listed
tripotassium hexacyanoferrate	Listed	Not Listed	Listed	Not Listed
trisodium orthophosphate	Listed	Not Listed	Listed	Not Listed
citric acid	Listed	Not Listed	Listed	Not Listed
glutaraldehyde	Listed	Not Listed	Listed	Not Listed

SARA 313

Refer to kit component SDS for full SARA Section 313 reporting requirements.

Chemical name	CAS No	SARA 313 - Threshold Values %
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formaldehyde (stabilised)	50-00-0	0.1
tetrapotassium iron (2+) hexacyanide trihydrate	14459-95-1	1.0
tripotassium hexacyanoferrate	13746-66-2	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

Refer to kit component SDS for full Clean Water Act (CWA) reporting requirements.

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances	CWA - Bioaccumulative Chemicals of Concern (BCCs)
formaldehyde (stabilised)	100 lb	Not Listed	Not Listed	Listed	Not Listed
tetrapotassium iron (2+) hexacyanide trihydrate	Not Listed	Listed	Listed	Not Listed	Not Listed
tripotassium hexacyanoferrate	Not Listed	Listed	Listed	Not Listed	Not Listed
trisodium orthophosphate	5000 lb	Not Listed	Not Listed	Listed	Not Listed

CERCLA

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs
formaldehyde (stabilised)	100 lb	100 lb
trisodium orthophosphate	5000 lb	Not Listed

California Proposition 65

Refer to kit component SDS for full California Proposition 65 information.

Chemical name	California Prop. 65
formaldehyde (stabilised)	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
formaldehyde (stabilised)	Listed	Listed	Listed
tetrapotassium iron (2+) hexacyanide trihydrate	Listed	Not Listed	Listed
tripotassium hexacyanoferrate	Listed	Not Listed	Listed
trisodium orthophosphate	Listed	Listed	Listed
glutaraldehyde	Listed	Listed	Listed
disodium	Listed	Listed	Listed

hydrogenorthophosphate			
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SECTION 16. Other information**Issuing Date:** 2017-10-17**Revision Date:** 2022-11-21**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet