Safety Data Sheet
Iron Assay Reagents

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Iron Assay Reagents

Company information: Bell Biosystems Inc., 626 Bancroft Way, Suite A, Berkeley, CA 94710

Company phone number: (877) 420-3621

Assay reagent	Component description	Volume	Safety information
Iron Standard	Iron in dilute nitric acid (2%)	2 vials of 150 µL	See below
Iron Probe Reagent	Proprietary composition	2 vials of 2 mL	No hazards except for L-ascorbic acid (see below)

2. HAZARDS IDENTIFICATION

2.1 Iron in dilute nitric acid

GHS

Classification

Skin corrosion/irritation	Category 1 Sub-category A
Serious eye damage/Eye irritation	Category 1

Label elements

Danger

Hazard statements

Causes severe skin burns and eye damage.

Appearance Clear / Light tan **Physical State** Frozen liquid **Odor** Odorless

Precautionary statements – Prevention

Do not breathe dust/fume/gas/mist/vapors/spray.
Wash face, hands and any exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements – Response

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Skin

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor/physician.

Ingestion

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Precautionary statements – Storage

Store locked up.

Precautionary statements – Disposal

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

2.2 L-ascorbic acid

GHS

Classification

Combustible dust if in powder form. Please note that in the Iron Probe Reagent, L-ascorbic acid is in solution.

Hazard statements

May form combustible dust concentrations in air. Please note that in the Iron Probe Reagent, L-ascorbic acid is in solution.

Label elements

Hazard statements

May form combustible dust concentrations in air in if powder form. Please note that in the Iron Probe Reagent, L-ascorbic acid is in solution.

Pictogram	None
Signal word	Warning
Precautionary statements	None

Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust. Please note that in the Iron Probe Reagent, L-ascorbic acid is in solution.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Iron in dilute nitric acid

Chemical Name	CAS-No.	Concentration
Nitric acid	7697-37-2	2%
Iron	7439-89-6	0.0559%

3.2 L-ascorbic acid

Substances

Synonyms: Antiscorbutic factor
L-Threoascorbic acid
Vitamin C

Formula: $C_6H_8O_6$
Molecular weight: 176.12 g/mol
CAS-No.: 50-81-7
EC-No.: 200-066-2

No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES

4.1 Iron in dilute nitric acid

First aid measures

General advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye contact Immediate medical attention is required. Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area.

Skin contact Contact Immediate medical attention is required. Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.

Inhalation Call a physician or Poison Control Center immediately. Move to fresh air. If breathing is difficult, give oxygen. If breathing is irregular or stopped, administer artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation.

Ingestion Immediate medical attention is required. Do NOT induce vomiting. Clean mouth with water and afterwards drink plenty of water. Never give anything by mouth to an unconscious person.

Protection of first-aiders Use personal protective equipment. Avoid contact with skin, eyes and clothing.

Most important symptoms and effects, both acute and delayed
Difficulty breathing.

Indication of any immediate medical attention and special treatment needed

Notes to physician Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure.

4.2 L-ascorbic acid

First aid measures

Eye contact Flush eyes with water as a precaution.

Skin contact Wash off with soap and plenty of water.

Inhalation If breathed in, move person into fresh air. If not breathing, give artificial respiration.

Ingestion Never give anything by mouth to an unconscious person. Rinse mouth with water.

Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in section 11.2.

Indication of any immediate medical attention and special treatment needed
No data available.

5. FIRE-FIGHTING MEASURES

5.1 Iron in dilute nitric acid

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
Decomposition by contact with water may generate vapors, which can be ignited by heat or open flame.

Special exposure hazards arising from the substance/mixture
The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors.

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.

5.2 L-ascorbic acid

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special hazards arising from the substance/ mixture
Carbon oxides.

Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

Further information
No data available.

6. ACCIDENTAL RELEASE MEASURES

6.1 Iron in dilute nitric acid

Personal precautions, protective equipment and emergency procedures
Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment specified under section 8.1. Do not get in eyes, on skin, or on clothing.

Environmental Precautions
Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. Prevent product from entering drains. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Methods and material for containment and cleaning up
Dam up. Neutralize with lime milk; soda. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.2 L-ascorbic acid

Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapors, mist or gas. For personal protection see section 8.2.

Environmental precautions
No special environmental precautions required.

Methods and materials for containment and cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

7.1 Iron in dilute nitric acid

Precautions for safe handling
Wear personal protective equipment. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist.

Conditions for safe storage, including any incompatibilities

Technical measures/precautions Keep containers tightly closed at -80°C until use.

Incompatible products None known based on information supplied.

7.2 L-ascorbic acid

Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. Please note that in the Iron Probe Reagent, L-ascorbic acid is in solution.

Conditions for safe storage, including any incompatibilities

Technical measures/precautions Keep containers tightly closed at -80°C until use.

Incompatible products None known based on information supplied.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Iron in dilute nitric acid

Control parameters

Exposure guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Nitric acid 7697-37-2	4 ppm STEL TWA: 2 ppm	TWA: 2 ppm TWA: 5 mg/m3 (vacated) TWA: 2 ppm (vacated) TWA: 5 mg/m3 (vacated) STEL: 4 ppm (vacated) STEL: 10 mg/m3	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m3 STEL: 4 ppm STEL: 10 mg/m3

Appropriate engineering controls
Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Eye protection Tightly fitting safety goggles and face-shield.

Skin and body protection	Impervious clothing, boots, chemical resistant apron.
Hand protection	Impervious gloves.
Respiratory protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Wear suitable gloves and eye/face protection. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing.

8.2 L-ascorbic acid

Control parameters

Appropriate engineering controls
General industrial hygiene practice.

Individual protection measures, such as personal protective equipment

Eye protection	Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin and body 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. Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection	Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice. Wear suitable gloves and eye/face protection. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product. Remove and wash contaminated clothing before re-use. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Iron in dilute nitric acid

Information on basic physical and chemical properties

Physical state	Frozen liquid
Appearance	Clear / Light tan
Odor	Odorless
pH value	No data available.
Melting point/range	No data available.
Boiling point/pange	100 °C
Evaporation rate	No data available.
Flammability (solid, gas)	No data available.
Vapor pressure	No data available.
Vapor density	No data available.
Relative density	No data available.
Specific gravity	No data available.
Water solubility	Miscible
Partition coefficient: n-octanol/water	No data available.
Autoignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Explosive properties	No information available.
Oxidizing properties	No information available.

Other information No information available.

9.2 L-ascorbic acid

Information on basic physical and chemical properties

Physical state	Frozen liquid
Appearance	No data available when in Iron Probe Reagent.
Odor	No data available.
Odor threshold	No data available.
pH	1.0 - 2.5 at 176 g/l at 25 °C (77 °F)
Melting point/freezing point	Melting point/range: 190 - 194 °C (374 - 381 °F)
Initial boiling point and boiling range	No data available.
Flash point	No data available.
Evaporation rate	No data available.
Flammability (solid, gas)	May form combustible dust concentrations in air.
Upper/lower flammability or explosive limits	No data available.
Vapor pressure	No data available.
Vapor density	No data available.
Relative density	No data available.
Water solubility	176 g/l at 20 °C (68 °F) - completely soluble.
Partition coefficient: n-octanol/water	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	No data available.
Viscosity	No data available.
Explosive properties	No data available.
Oxidizing properties	No data available.

Other information No data available.

10. STABILITY AND REACTIVITY

10.1 Iron in dilute nitric acid

Reactivity
No data available.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Hazardous Polymerization Hazardous polymerization does not occur.

Conditions to avoid
None known.

Incompatible materials
Reducing agents.

Hazardous decomposition products
Nitrogen oxides (NOx).

10.2 L-ascorbic acid

Reactivity
No data available.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
No data available.

Conditions to avoid
Light.

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
Other decomposition products - No data available.

11. TOXICOLOGICAL INFORMATION

11.1 Iron in dilute nitric acid

Product information The product causes burns of eyes, skin and mucous membranes.

Information on likely routes of exposure

Eye contact Causes burns.

Skin contact Causes burns.

Ingestion Can burn mouth, throat, and stomach.

Inhalation Contact with moist mucous membranes of the respiratory system can cause caustic condition resulting in burns. Aspiration may cause pulmonary edema and pneumonitis. Causes burns. Corrosive to respiratory system. Inhaled corrosive substances can lead to a toxic edema of the lungs.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid 7697-37-2 (5)	-	-	= 130 mg/m3 (Rat) 4 h = 67 ppm (Rat) 4 h
Iron 7439-89-6 (1)	= 984 mg/kg (Rat)	-	-

Information on toxicological effects

Symptoms No information available.

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

Sensitization No information available.

Mutagenic effects No information available.

Carcinogenic effects

Chemical Name	ACGIH	IARC NTP OSHA	IARC NTP OSHA	IARC NTP OSHA
Nitric acid 7697-37-2		Group 2A		

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Target organ effects Skin, eyes, respiratory system.

Aspiration hazard No information available.

Numerical measures of toxicity - Product information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral)	98400 mg/kg
ATEmix (inhalation-dust/mist)	436 mg/L
ATEmix (inhalation-vapor)	1340 mg/L

11.2 L-ascorbic acid

Information on toxicological effects

Acute toxicity	LD50 Oral - Rat - 11,900 mg/kg Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Lacrimation. Behavioral: Somnolence (general depressed activity). Diarrhea.
Inhalation	No data available.
Dermal	No data available.
Skin corrosion/irritation	No data available.
Serious eye damage/eye irritation	No data available.
Respiratory or skin sensitization	No data available.
Germ cell mutagenicity	Mouse**:** liver**;** Other mutation test systems**:** Mouse Micronucleus test

Carcinogenicity

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	No data available.
Specific target organ toxicity - single exposure	No data available.
Specific target organ toxicity - repeated exposure	No data available.
Aspiration hazard	No data available.
Additional information	RTECS: CI7650000

Chronic ingestion of large doses may cause gastrointestinal disturbances including nausea and diarrhea, urinary effects involving urine acidification, oxalate and uric crystallization in the bladder and kidney, and decreased reaction times and psychomotor coordination.

12. ECOLOGICAL INFORMATION

12.1 Iron in dilute nitric acid

Ecotoxicity

Ecotoxicity effects
0% of the mixture consists of components(s) of unknown hazards to the aquatic environment.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Microtox	Daphnia Magna (Water Flea)
Nitric acid 7697-37-2		72: 96 h Gambusia affinis mg/L LC50		
Iron 7439-89-6		13.6: 96 h Morone saxatilis mg/L LC50 static		

Persistence and degradability
No information available.

Bioaccumulation/Accumulation
No information available.

Chemical Name	Log Pow
Nitric acid 7697-37-2	-2.3

12.2 L-ascorbic acid

Ecotoxicity
No data available.

Persistence and degradability
No data available.

Bioaccumulation/Accumulation
No data available.

Mobility in soil
No data available.

Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

Other adverse effects
No data available.

13. DISPOSAL CONSIDERATIONS

13.1 Iron in dilute nitric acid

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with federal, state and local regulations.

Contaminated packaging Do not re-use empty containers.

Chemical Name	California Hazardous Waste Status
Nitric acid 7697-37-2	Toxic Corrosive Ignitable

13.2 L-ascorbic acid

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with federal, state and local regulations.

Contaminated packaging Do not re-use empty containers.

14. TRANSPORT INFORMATION

14.1 Iron in dilute nitric acid

IMDG/IMO

UN-No	UN3264
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s
Hazard class	8
Packing group	III
Description	Not applicable.
Marine pollutant	None
Special provisions	None
Transport in bulk according o Annex II of MARPOL 73/78 and the IBC Code	No information available.

RID

UN-No	UN3264
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s
Hazard class	8
Packing group	III
Description	Not applicable.
Environmental hazard	None
Special provisions	None

ADR

UN-No	UN3264
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s
Hazard class	8
Packing group	III
Description	Not applicable.
Environmental hazard	None
Special provisions	None

ICAO

UN-No	UN3264
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s
Hazard class	8
Packing group	III
Description	Not applicable.
Environmental hazard	None
Special provisions	None

IATA-DGR

UN-No	UN3264
Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s
Hazard Class	8
Packing Group	III
Description	Not applicable.
Environmental hazard	None
Special provisions	None

14.2 L-ascorbic acid

DOT (US) Not dangerous goods.

IMDG Not dangerous goods.

IATA Not dangerous goods.

15. REGULATORY INFORMATION

15.1 Iron in dilute nitric acid

International inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

U.S. federal regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

SARA 311/312 hazard categories

Acute health hazard	No
Chronic health hazard	No
Fire hazard	No
Sudden release of pressure hazard	No
Reactive hazard	No

Clean Water Act
This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nitric acid 7697-37-2	1000 lb			

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Nitric acid 7697-37-2	1000 lb	1000 lb	RQ 1000 lb final RQ RQ 454 kg final RQ

U.S. state regulations

California Proposition 65
Does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nitric acid 7697-37-2	x	x	x

15.2 L-ascorbic acid

SARA 302 components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 hazards
No SARA hazards

U.S. state regulations

California Proposition 65
L-Ascorbic acid is not known to State of California to cause cancer, birth defects, or any other reproductive harm.

U.S. State Right-to-Know regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
L-Ascorbic acid 50-81-7	x	x	x

16. OTHER INFORMATION

Revision date June 27, 2018

Revision note No information available.

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. Bell Biosystems Inc. shall not be held liable for any damage resulting from handling.

End of SDS