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## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product:** Bovine Sera  
**Grade:** All Grades  
**Part Number:** 1600, 1500, 1400, 1300, 2100  
**Date:** August 2014, Rev 6  
**Product Origin:** USA and USDA Approved Origin Countries (Mexico and Central America)  
**Synonyms/Acronyms:** None/FBS/BCS/Fetal Bovine Serum/Bovine Calf Serum  
**Recommended Use:** In vitro methods  
**Company:** Seradigm  
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## 2. HAZARDS IDENTIFICATION

**Emergency Overview:** All serum products should be treated as potentially infectious and handled as if capable of transmitting infectious agents. May cause eye and skin irritation. Handle in accordance with good industrial hygiene and safety practice. Low hazard for usual industrial or commercial handling.

**Appearance:** Yellow-orange color  
**Physical State:** Liquid  
**Odor:** Characteristic  
**Target Organs:** None known  
**Potential Health Effects:** Acute effects: Principle routes of exposure  
Eyes – may cause irritation  
Skin – may cause irritation  
Inhalation – low hazard for usual industrial or commercial handling  
Ingestion – low hazard for usual industrial or commercial handling  
Chronic effects: None known; see Section 11 for additional toxicological information  
Aggravated medical conditions: No information available

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS#	Weight %
Bovine Blood Component	N/A	</= 100
Process Water	7732-18-5	</= 25
Inorganic Salts	N/A	</= 40
Vitamins	N/A	</= 2
Amino Acids	N/A	</= 1
Standard Cell Culture Media	N/A	</= 1
Ethanolamine	141-43-5	</= 0.5
Ammonium Metavanadate	7803-55-6	</= 0.5

#### 4. FIRST AID MEASURES

<b>Eye Contact:</b>	Rinse immediately with plenty of water, also under the eyelids for at least 15 minutes; obtain medical attention.
<b>Skin Contact:</b>	Wash off immediately with plenty of water for at least 15 minutes; obtain medical attention immediately if symptoms occur.
<b>Inhalation:</b>	Move to fresh air; if breathing is difficult, give oxygen; get medical attention immediately if symptoms occur.
<b>Ingestion:</b>	Do not induce vomiting; obtain medical attention.
<b>Notes to Physicians:</b>	Treat symptomatically.

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#### 5. FIREFIGHTING MEASURES

<b>Flash Point:</b>	Not applicable Method: No information available
<b>Autoignition Temperature:</b>	No information available
<b>Explosion Limits:</b>	Upper: No data available Lower: No data available
<b>Suitable Extinguishing Media:</b>	Substance is non-flammable; use agent most appropriate to extinguish surrounding fire.
<b>Unsuitable Extinguishing Media:</b>	No information available
<b>Hazardous Combustion Products:</b>	Sensitivity to mechanical impact: No information available Sensitivity to static discharge: No information available
<b>Specific Hazards Arising from the Chemical:</b>	Thermal decomposition can lead to release of irritating gases and vapors.
<b>Protective Equipment &amp; Precautions for Firefighters:</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

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#### 6. ACCIDENTAL RELEASE MEASURES

<b>Personal Precautions:</b>	Use personal protective equipment; ensure adequate ventilation; avoid contact with skin, eyes, and clothing.
<b>Environmental Precautions:</b>	Should not be released into the environment.
<b>Methods for Containment &amp; Clean Up:</b>	Soak up with inert absorbent material; after clean-up, disinfect affected area with bleach and water at a ratio of 1:20; dispose of clean up material in marked biohazard container.

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#### 7. HANDLING & STORAGE

<b>Handling:</b>	Wear personal protective equipment; handle as potentially infectious; avoid contact with skin, eyes, and clothing; handle in accordance with good industrial hygiene and safety practice. Product should be handled aseptically and stored in sterile conditions to avoid bacterial contamination.
<b>Storage:</b>	Keep containers tightly closed in a dry, cool, and well-ventilated place. Maintain at -10° to -20°C.

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#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<b>Engineering Measures:</b>	Ensure adequate ventilation, especially in confined areas; ensure that eyewash stations and safety showers are located near the workstation.
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##### Exposure Guidelines:

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH*
Ethanolamine	TWA: 3ppm STEL: 6ppm	(Vacated) TWA: 8mg/m <sup>3</sup> (Vacated) TWA: 3ppm (Vacated) STEL: 6ppm	IDLH: 30ppm TWA: 8mg/m <sup>3</sup> TWA: 3ppm

**Exposure Guidelines Continued:**

<b>Component</b>	<b>ACGIH TLV</b>	<b>OSHA PEL</b>	<b>NIOSH IDLH*</b>
Ethanolamine		(Vacated) STEL: 15mg/m <sup>3</sup> TWA: 6mg/m <sup>3</sup> TWA: 3ppm	STEL: 6ppm STEL: 15mg/m <sup>3</sup>
Ammonium Metavanadate			Ceiling: 0.05mg/m <sup>3</sup>
<b>Component</b>	<b>Quebec</b>	<b>Mexico OEL (TWA)</b>	<b>Ontario TWAEV</b>
Ethanolamine	TWA: 3ppm TWA: 7.5mg/m <sup>3</sup> STEL: 6ppm STEL: 15mg/m <sup>3</sup>	TWA: 3ppm TWA: 8mg/m <sup>3</sup> STEL: 6ppm STEL: 15mg/m <sup>3</sup>	TWA: 3ppm TWA: 7.5mg/m <sup>3</sup> STEL: 6ppm STEL: 15mg/m <sup>3</sup>

\*NIOSH IDLH: Immediately Dangerous to Life or Health

**Personal Protective Equipment:** Eye/Face Protection: Wear appropriate eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Skin & Body Protection: Wear appropriate protective gloves and clothing to prevent skin exposure. Respiratory Protection: Follow OSHA respirator regulations found in 29 CFR 1910.34 or European Standard EN149; use an NIOSH/MSHA or European Standard EN149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**9. PHYSICAL & CHEMICAL PROPERTIES**

<b>Physical State:</b>	Liquid
<b>Appearance:</b>	Yellow-orange color
<b>Odor:</b>	Characteristic
<b>Odor Threshold:</b>	No information available
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	No information available
<b>Vapor Density:</b>	No information available
<b>Viscosity:</b>	No information available
<b>Boiling Point/Range:</b>	Not applicable
<b>Melting Point/Range:</b>	No information available
<b>Decomposition Temperature:</b>	No information available
<b>Flash Point:</b>	Not applicable
<b>Evaporation Rate:</b>	No information available
<b>Specific Gravity:</b>	No information available
<b>log Pow:</b>	No data available

**10. STABILITY & REACTIVITY**

<b>Stability:</b>	Stable under normal conditions
<b>Conditions to Avoid:</b>	Excess heat
<b>Incompatible Materials:</b>	None known
<b>Hazardous Decomposition Products:</b>	None known
<b>Hazardous Polymerization:</b>	Hazardous polymerization does not occur
<b>Hazardous Reactions:</b>	None under normal processing/handling

**11. TOXICOLOGY INFORMATION**

**Acute Toxicity:** Product information; no acute toxicity is available for this product. Component information, see table

## Acute Toxicity Continued

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethanolamine	1720 mg/kg (Rat)	1mL/kg (Rabbit) 1025 mg/kg (Rabbit)	Not Listed
Ammonium Metavanadate	58.1 mg/kg (Rat)	2102 mg/kg (Rat)	7800 µg/ m <sup>3</sup> (Rat/ 4h)
Process Water	90 mL/kg (Rat)	Not listed	Not listed

### Chronic Toxicity:

Irritation: No information available  
Toxicologically synergistic products: No information available  
Carcinogenicity: There are no known carcinogenic chemicals in this product  
Sensitization: No information available  
Mutagenic effects: No information available  
Reproductive effects: No information available  
Developmental effects: No information available  
Teratogenicity: No information available  
Other adverse effects: The toxicological properties have not been fully investigated  
Endocrine disruptor information: No information available

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## 12. ECOLOGICAL INFORMATION

### Ecotoxicity:

Component	Fresh Water Algae	Fresh Water Fish	Microtox	Water Flea
Ethanolamine	15mg/L EC50 = 72h	114-196mg/L LC50 96h 200mg/L LC50 96h 3684mg/L LC50 96h 227mg/L LC50 96h 300-1000mg/L LC50 96h	= 110mg/L EC50 Pseudomonas putida 17h = 12200mg/L EC50 Nitrosomonas 2h = 13.7mg/L EC50 Photobacterium phosphoreum 30min	65mg/L EC50 = 48h
Ammonium Metavanadate	Not listed	1.5mg/L LC50 144h	Not listed	Not listed

**Persistence & Degradability:** No information available

**Bioaccumulation/ Accumulation:** No information available

### Mobility:

Component	log Pow
Ethanolamine	0

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## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods:** Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. Chemical waste generators must also consult local, regional and national hazardous waste regulations to ensure complete and accurate classification.

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## 14. TRANSPORT INFORMATION

Bovine Serum is considered non-hazardous. Bovine Serum is transported in the frozen state on dry ice. For air shipments, dry ice is considered non-hazardous. IATA sections 904, 954 and special provisions A151 and A805 govern the use and packaging of dry ice used as a refrigerant during transportation, parts of which are quote below:

## 14. TRANSPORT INFORMATION continued

“Carbon dioxide, solid (dry ice), when offered for transport by air, must be in packaging designed and constructed to permit the release of carbon dioxide gas and to prevent build-up of pressure that could rupture the packaging. The net weight of the Carbon dioxide, solid (dry ice) must be marked on the outside of the package. Arrangements between shipper and operators must be made for each shipment, to ensure ventilation safety procedures are followed. The Shipper’s Declaration requirements of Subsections 8.1 and 10.8.1 are only applicable when the Carbon dioxide, solid (dry ice) is used as a refrigerant for dangerous goods that require a Shipper’s Declaration. When a Shipper’s Declaration is not required, the information as required by 8.2.3 for the Carbon dioxide, solid (dry ice) must be contained in the “Nature and Quantity of Goods” box on the air waybill, excluding the packing instruction number and packing group. When dry ice is used as a refrigerant for other than dangerous goods loaded in a unit load device or other type of pallet, the quantity limits per package shown in columns J and L in Section 4.2 for dry ice do not apply. In such case, the unit load device or other type of pallet must be identified to the operator and must allow the venting of the carbon dioxide gas to prevent a dangerous build up of pressure. Dry ice may be packed directly into an overpack without an intervening packaging.”

## 15. REGULATORY INFORMATION

All of the components in the product are on the following inventory lists:

Inventory List	Process Water	Ethanolamine	Ammonium Metavanadate
TSCA	X	X	X
DSL	X	X	X
NDSL	-	-	-
EINECS	-	205-483-3	232-261-3
ELINCS	-	-	-
NLP	-	-	-
PICCS	X	X	X
ENCS	-	X	X
AICS	X	X	X
CHINA	X	X	X
KECL	X	KE-20493X	KE-01756X

Legend:

X – Listed

E – Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA

F – Indicates a substance that is the subject of a Section 5(f) Rule under TSCA

N – Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used

P – Indicates a commenced PMN substance

R – Indicates a substance that is the subject of a Section 6 Risk Management Rule under TSCA

S – Indicates a substance that is identified in a proposed or final Significant New Use Rule

T – Indicates a substance that is the subject of a Section 4 Test Rule under TSCA

XU – Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Database Product and Site Reports (40 CFR 710B)

Y1 – Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater

Y2 – Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule

### U.S. Federal Regulations

TSCA 12(b): Not applicable

SARA 313: See table

Component	CAS#	Weight %	SARA 313- Threshold Values %
Ammonium Metavanadate	7803-55-6	</= 0.5	1.0

### SARA 311/312 Hazardous Categorization

Acute health hazard:	No
Chronic health hazard:	No
Fire hazard:	No
Sudden release of pressure hazard:	No
Reactive hazard:	No
Clean Water Act:	Not applicable

## 15. REGULATORY INFORMATION continued

SARA 311-312 Hazardous Categorization continued

Clean Air Act: Not applicable

OSHA: Not applicable

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). See table:

Component	Hazardous Substances RQs	CERCLA EHS RQs
Ammonium Metavanadate	1000 lb	

California Proposition 65: Does not contain any Proposition 65 chemicals. State Right-to-Know; see table:

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Ammonium Metavanadate	X	X	X	X	X
Ethanolamine	X	X	X	-	-

U.S. Department of Transportation:

Reportable Quantity: Y

DOT Marine Pollutant: N

DOT Severe Marine Pollutant: N

U.S. Department of Homeland Security: Does not contain any DHS chemicals

### Other Regulations:

Mexico: No information available

Canada: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

WHMIS Hazard Class: D3 Biohazardous Infectious Materials



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## 16. OTHER INFORMATION

**Prepared by:** Seradigm  
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**Disclaimer:** The information provided on the Material Safety Data Sheet (MSDS) 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

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END OF MATERIAL SAFETY DATA SHEET