

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): **EASYSTART**
CHEMICAL NAME/CLASS: Aqueous Solution
SYNONYMS: Not applicable.

MANUFACTURER'S NAME: Molecular BioProducts, Inc.
ADDRESS: 9880 Mesa Rim Road
San Diego, CA 92121

EMERGENCY PHONE: Chemtrec: Toll free, 24-hour line: 800-424-9300
BUSINESS PHONE: 858-453-7551
DATE OF PREPARATION: April 30, 1996

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% v/v	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			OTHER
			TLV	STEL	PEL	STEL	IDLH	
Magnesium Chloride	7786-30-3	< 1	NE	NE	NE	NE	NE	NE
Tris-Hydroxymethylaminomethane hydrochloride	1185-53-1	< 1	NE	NE	NE	NE	NE	NE
Potassium Chloride	7447-40-7	< 1	NE	NE	NE	NE	NE	NE
Deoxy-Adenine Triphosphate	1927-31-7	< 1	NE	NE	NE	NE	NE	NE
Deoxy-Cytosine Triphosphate	102783-51-7	< 1	NE	NE	NE	NE	NE	NE
Deoxy-Guanine Triphosphate	93919-41-8	< 1	NE	NE	NE	NE	NE	NE
Deoxy-Thymidine Triphosphate	3458-14-8	< 1	NE	NE	NE	NE	NE	NE
Water	7732-18-5	Balance	NE	NE	NE	NE	NE	NE

NE = Not Established

C = Ceiling Level See Section 16 for Definitions of Terms Used.

Note: All WHMIS information is included in the appropriate sections of the MSDS, which is prepared to the standards of the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, colorless liquid. The primary hazard associated with the component reagents of this product is the potential for mild irritation of contaminated tissue. The components of this product are not flammable nor reactive. In the event of a fire, this product will not contribute significant additional hazards.

SYMPTOMS OF OVER-EXPOSURE BY ROUTE OF EXPOSURE: No adverse health effects should occur from routine use of this material in the manner specified by the manufacturer's instructions. The only likely symptom of exposure would be reddening or inflammation after accidental injection.

INHALATION: Inhalation of this product may cause mild irritation. Symptoms are generally alleviated upon breathing fresh air.

CONTACT WITH SKIN OR EYES: If this product comes in contact with the skin or eyes, mild irritation may develop. This irritation will be alleviated upon rinsing.

SKIN ABSORPTION: Skin absorption is not a potential route of exposure for any component of this product.



INGESTION: Though not a likely route of occupational exposure, ingestion of this product's reagent components, especially in large quantities, may cause gastric distress.

INJECTION: Injection of this product may cause local reddening, tissue swelling, and discomfort.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. This solution is not known to cause significant acute or chronic health effects.

ACUTE: Beyond mild irritation of the skin or eyes, contact with this product does not usually cause acute health effects.

CHRONIC: This product is not known to cause any significant chronic health effects.

HAZARDOUS MATERIAL INFORMATION SYSTEM			
HEALTH		(BLUE)	1
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			B
EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8
For routine industrial applications			

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

SKIN EXPOSURE: Basic hygiene should prevent any problems. If contact with this product leads to reddening, inflammation, or irritation, flush the exposed area with running water. Remove any contaminated clothing, taking care not to contaminate eyes.

EYE EXPOSURE: If chemical is splashed in eyes, open victim's eyes while under gentle running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes.

INHALATION: If vapor or mist of this product is inhaled, causing irritation, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: If chemical is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Victim should drink milk, egg whites, or large quantities of water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow.

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or health professional with the victim.

5. FIRE-FIGHTING MEASURES

FLASH POINT, °C (method): Not applicable.

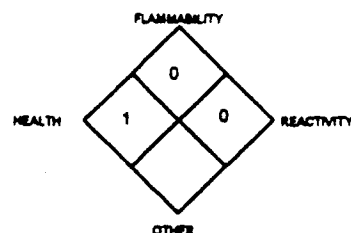
AUTOIGNITION TEMPERATURE, °C: Not applicable.

FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): Not applicable.
Upper (UEL): Not applicable.

NFPA RATING

FIRE EXTINGUISHING MATERIALS: In the event of a fire, use suppression methods for surrounding materials.

Water Spray: YES **Carbon Dioxide:** YES **Foam:** YES
Dry Chemical: YES **Halon:** YES **Other:** Any "ABC" Class.



UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may decompose and produce irritating fumes and toxic gases including carbon monoxide, carbon dioxide, and oxides of magnesium and potassium.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural fire fighters must wear Self-Contained Breathing Apparatus and full protective equipment.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: For small releases, take basic hygiene precautions. Lightweight gloves, a lab coat and eye protection should be worn. Absorb spilled liquid with paper towels. Wash contaminated area with soap and water, absorb with paper towels, and rinse with water. Large releases which are not immediately controlled, should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a non-incident spill, clear the affected area, protect people, and respond with trained personnel. Minimum Personal Protective Equipment should be **Level D: lab-gloves, chemically resistant apron, boots, and splash goggles. Respiratory protection should not be necessary.** Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Place all spill residue in a double plastic bag and seal. Dispose of in accordance with Federal, State, and local hazardous waste disposal regulations (see Section 13).

PART III

How can I prevent hazardous situations from occurring?

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: Avoid getting chemicals ON YOU or IN YOU. Wash hands after handling chemicals. Avoid splashing or spraying this product. Do not eat or drink while handling chemicals.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Avoid breathing vapors or mists generated by this product. Store vials in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep vials tightly closed when not in use. Wash thoroughly after using this material. Read instructions provided with the product prior to use.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain application equipment is locked and tagged-out safely, as applicable. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment using soapy water before maintenance begins. Collect all rinsates and dispose of according to applicable Federal, State, or local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation.

RESPIRATORY PROTECTION: Respiratory protection is not generally needed when using this product. Maintain airborne contaminant concentrations below guidelines listed in Section 2. If respiratory protection is needed, use only protection authorized in 29 CFR 1910.134, or applicable State regulations. Use supplied air respiration protection if oxygen levels are below 19.5% or are unknown.

EYE PROTECTION: Splash goggles or safety glasses.

HAND PROTECTION: Wear laboratory gloves for routine occupational use.

BODY PROTECTION: Use body protection appropriate for task.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: Approximately 17 g/m³.

SPECIFIC GRAVITY: Approximately 1 @ 4 °C.

SOLUBILITY IN WATER: Completely.

VAPOR PRESSURE, mm Hg @ 20°C: Approximately 18 mm Hg.

EVAPORATION RATE (water=1): 1

MELTING POINT: Approximately 0 °C.

BOILING POINT: Approximately 100 °C.

pH: Approximately 7.

APPEARANCE AND COLOR: Clear, colorless liquid.

HOW TO DETECT THIS SUBSTANCE: There are no unusual warning properties are associated with this solution.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may produce carbon dioxide, carbon monoxide, and oxides of potassium and magnesium.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is not compatible with strong acids, strong bases, and strong oxidizers. This solution would also be incompatible with water-reactive materials.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Any conditions which are incompatible with water. Avoid mixing this product with incompatible chemicals.

PART IV

Is there any other useful information about this material?

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: No specific toxicity data is available for this product. Due to the dilute concentration of the components (which are all present in less than 1 percent concentration in this product), no adverse health effects should occur from routine use of this material in the manner specified by the manufacturer's instructions. The only likely symptom of exposure would be reddening or inflammation after accidental injection.

SUSPECTED CANCER AGENT: This product's ingredients are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA.

IRRITANCY OF PRODUCT: While not tested, this product is not expected to cause irritancy to the skin. Mild eye irritation may occur if this product is splashed in the eye.

SENSITIZATION TO THE PRODUCT: No component is known to be a sensitizer.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: Due to the dilute concentration of components, this product is not expected to cause mutation effects in humans. Human mutation data is reported for clinical studies involving high doses of Magnesium Chloride on specific human tissues.

Teratogenicity: This product is not expected to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not expected to cause adverse reproductive effects in humans.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES: Not applicable.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: No specific medical conditions are known to be aggravated by exposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: The components of this product will degrade in the environment into smaller organic and inorganic constituents.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No unusual effects on plants or animals are expected if this product is released into the environment; however, as with all chemicals, work practices should be aimed at minimizing environmental releases.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product is not known to cause adverse effects on aquatic life; however, as with all chemicals, work practices should be aimed at minimizing environmental releases.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This chemical, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: Not applicable for this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:	Not applicable.
HAZARD CLASS NUMBER and DESCRIPTION:	Not applicable.
UN IDENTIFICATION NUMBER:	Not applicable.
PACKING GROUP:	Not applicable.
DOT LABEL(S) REQUIRED:	Not applicable.
EMERGENCY RESPONSE GUIDE NUMBER:	Not applicable.
MARINE POLLUTANT:	Not applicable.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS NOT CONSIDERED AS DANGEROUS GOODS.

15. REGULATORY INFORMATION

SARA REPORTING REQUIREMENTS: This product and its components are not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

SARA Threshold Planning Quantity: Not applicable.

TSCA INVENTORY STATUS: The chemicals in this product are listed on the TSCA Inventory.

CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

OTHER FEDERAL REGULATIONS: Not applicable.

STATE REGULATORY INFORMATION: The components of this product are not covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: No.

California - Permissible Exposure Limits for Chemical Contaminants: No.

Florida - Substance List: No.

Illinois - Toxic Substance List: No.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: No.

Minnesota - List of Hazardous Substances: No.

Missouri - Employer Information/Toxic Substance List: No.

New Jersey - Right to Know Hazardous Substance List: No.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.

Pennsylvania - Hazardous Substance List: No.
Rhode Island - Hazardous Substance List: No.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.

Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA PROPOSITION 65: No component of this solution is on the California Proposition 65 lists.

LABELING (Precautionary Statements): Caution! May cause eye irritation. Ingestion may cause gastrointestinal distress. Avoid getting this product in your eyes. Avoid ingestion of this product. In case of contact rinse eye or affected skin thoroughly with water for at least 15 minutes. If irritation persists, seek medical assistance. Store in a cool, dry location away from sources of excess heat. Keep away from strong acids, strong bases, and strong oxidizers. Prevent freezing. Clean-up spills promptly. Refer to MSDS for additional information.

TARGET ORGANS: Skin, eyes.

WHMIS SYMBOLS: Not applicable.

16. OTHER INFORMATION

PREPARED BY:

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619/565-0302

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DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level. Skin adsorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - this exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The **IDLH** - Immediately Dangerous to Life and Health level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The **DFG** - MAK is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL.

NIOSH is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called Recommended Exposure Levels (RELs). When no exposure guidelines are established, an entry of NE is made for reference.

FLAMMABILITY LIMITS IN AIR: Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). **LEL** - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. **UEL** - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** - concentration expressed in parts of material per million parts of air or water; **mg/m³** - concentration expressed in weight of substance per volume of air; **mg/kg** - quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program; **RTECS** - the Registry of Toxic Effects of Chemical Substances; **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause death. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV.

REGULATORY INFORMATION

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazard information System. **DOT** and **CTC** are the U.S. Department of Transportation and the Canadian Transportation Commission, respectively. These are: **Superfund Amendments and Reauthorization Act (SARA)**; the **Toxic Substance Control Act (TSCA)**; **Marine Pollutant status** according to the DOT; **California's Safe Drinking Water Act (Proposition 65)**; the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund)**; and various state regulations. This section also includes information on the precautionary warnings which appear on the materials package label.