SAFETY DATA SHEET MAPEP MaSF Performance Standards

U.S. Department of Energy – Radiological and Environmental Sciences Laboratory **SDS DATE: 03/19/2025**

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: MAPEP Radionuclide Synthetic Fecal Mixture (MaSF)

MANUFACTURER: U.S. Department of Energy
DIVISION: Radiological and Environmental Sciences Laboratory
ADDRESS: 2251 N. Boulevard, RESL-601, Idaho Falls, ID 83415

CAS #: Mixture
RTECS: Not Applicable
TSCA: TSCA 8(b)b Inventory: No Hazardous Constituents

Synonym Chemical Name: Mixed Analyte Synthetic Fecal
Chemical Formula: Mixture

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
International CHEMTREC, call: 1-703-527-3887
For non-emergency assistance, call: 1-208-526-2532

PRODUCT USE: Performance Evaluation Program – Analytical Standard
PREPARED BY: Radiological and Environmental Sciences Laboratory

SECTION 2: HAZARDS IDENTIFICATION

Fecal Mixture

EMERGENCY OVERVIEW: May be harmful by inhalation, skin absorption or ingestion. Flush thoroughly with water for external contact.

ROUTES OF ENTRY: May be harmful by inhalation, skin absorption or ingestion.

POTENTIAL HEALTH EFFECTS

EYES: Can cause severe eye irritation.
SKIN: Can cause skin irritation.
INGESTION: Can cause severe gastrointestinal problems.
INHALATION: May cause irritation of the respiratory tract. May aggravate or cause coughing, wheezing, shortness of breath and pulmonary edema.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS: Non-hazardous compound of various consumer products with trace radionuclide constituents. (Refer to ANSI/HPS N13.30, Table B3.) The total mass of the combined ingredients is ~102 grams.

CAS NO.	Ingredient	% VOL	SARA 313 REPORTABLE
7732-18-5	Water	64.04%	NA
61-90-5	L-Leucine	7.00%	NA
657-27-2	L-Lysine Monohydrochloride	5.02%	NA
9000-70-8	Gelatin	4.93%	NA
9004-34-6	Cellulose	3.94%	NA
57-10-3	Palmitic Acid	2.96%	NA
7722-79-1	Ammonium Dihydrogen Phosphate	2.07%	NA
57-11-4	Stearic Acid	1.97%	NA
302-84-1	DL-Serine	1.97%	NA
8002-03-7	Peanut Oil	1.48%	NA
112-80-1	Oleic Acid	0.99%	NA
1305-62-0	Calcium Hydroxide	0.96%	NA
584-08-7	Potassium Carbonate	0.82%	NA
59-51-8	Methionine	0.79%	NA
12125-28-9	Magnesium Carbonate	0.60%	NA
7757-82-6	Sodium Sulfate	0.36%	NA
7783-83-7	Ferric Ammonium Sulfate	0.04%	NA
12125-02-9	Ammonium Chloride	0.04%	NA
1314-95-0	Stannous Sulfide	0.03%	NA
1314-98-3	Zinc Sulfide	0.01%	NA

SECTION 3 NOTES: Trace radionuclides constitute less than 1% composition by weight. MAPEP samples are not classified as radioactive (total activity < 2 nCi/gram).

SECTION 4: FIRST AID

MEASURES In case of contact:

Eye Contact: Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open.
Skin contact: Flush skin continuously with water for at least 15 minutes. Use soap and water to cleanse skin.
Inhalation: Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Ingestion: Do not administer liquids or induce vomiting to an unconscious or convulsing person. Get medical attention immediately.

Notes to Physicians or First Aid Providers: Administer oxygen if patient is having difficulty breathing. If patient has stopped breathing administer artificial respirations. If patient is in cardiac arrest administer CPR. Continue life supporting measures until medical assistance has arrived. Remove and wash contaminated clothing. If patient is exhibiting signs of shock – keep warm and quiet. If patient is vomiting – watch closely to makes sure airway does not become obstructed by vomit.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable Extinguishing Methods: Water, Foam, Carbon Dioxide, Dry Powder, Alcohol Resistant Foam.

Unsuitable Extinguishing Methods: For this mixture, there are no limitations of extinguishing agents given.

Combustion Products: (See individual SDS's for more information)
Carbon Oxides
Nitrogen Oxides
Phosphorus Oxides
Hydrogen Chloride Gas
Potassium Oxides
Magnesium Oxides
Sulfur Oxides
Iron Oxides
Zinc Oxides

Notes: Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system. Gases may also be heavier than air and may travel along the ground.

Precautions for Fire-Fighters: In the event of fire, wear self-contained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions: Advice for non-emergency personnel: avoid substance contact; Stop the spill, if possible; contain spilled material by diking or using inert absorbent; ensure adequate ventilation; don't let it enter drains; observe emergency procedures; consult an expert.

Protective Equipment: For personal protection see section 8.

Methods and Materials for Containment and Cleaning Up: Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling: Keep the container dry. Do not inhale. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from organic incompatibles.

Conditions for Safe Storage: Tightly closed. Dry. Refrigerated. (See individual SDS's for more information).

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters:

Component	CAS-NO.	Value	Control Parameters	Basis
Cellulose	9004-34-6	TWA	10 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	15 mg/m3	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
		TWA	5 mg/m3	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	10 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Stearic Acid	57-11-4	TWA	10 gm/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	3 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
Peanut Oil	8002-03-7	TWA	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
Calcium Hydroxide	1305-62-0	TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Ferric Ammonium Sulfate	7783-83-7	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Stannous Sulfide	1314-95-0	TWA	2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	2 mg/m3	USA. NIOSH Recommended Exposure Limits

Engineering Controls: Change contaminated clothing. Wash hands after working with substance. Maintain appropriate exhaust ventilation.

Personal Protection:

Eye / Face Protection: Use proper eye and face equipment to protect against potential spills or splashes.
Skin Protection: Use proper gloves and clothing to cover the skin.
Respiratory Protection: Conduct work within a fume hood to avoid inhalation. If needed, a Filter Type P2 respirator is recommended.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Beige, Wet Powder
Odor: Weak
Odor Threshold: No Data Available
pH: No Data Available
Boiling Point: No Data Available
Melting Point: No Data Available
Flash Point: 110 °C (228 °F)
Evaporation Rate: No Data Available
Flammability: This product is not flammable
Explosive Limits: No Data Available
Vapor Pressure: 17.5 mmHg at 20 °C (68 °F)
Vapor Density: No Data Available
Relative Density: No Data Available
Solubility: Moderately Soluble
Partition Coefficient: No Data Available
Auto-Ignition Temperature: No Data Available
Decomposition Temperature: > 260 °C (500 °F)
Viscosity: No Data Available

Further information can be found on the SDS's of the individual constituents.

SECTION 10: STABILITY AND REACTIVITY

Reactivity: This product is not reactive.

Chemical Stability: The product is chemically stable under standard ambient conditions (room temperature).

Possibility of Hazardous Reactions: Strong oxidizing agents, high-oxygen materials, reducing agents, strong alkalis.

Conditions to avoid: Exposure to moisture may affect product quality. Avoid strong heating.

Incompatible Materials: Strong acids and strong bases, strong oxidizing and reducing agents.

Hazardous Decomposition Products: In the event of fire: see section 5

SECTION 11: TOXICOLOGICAL INFORMATION

Likely Routes of Entry: Inhalation, Ingestions, Skin Contact, Eye Contact

Symptoms related to physical, chemical and toxicological characteristics:

Inhalation: May cause irritation to the mouth, throat, and lungs. Symptoms may include coughing, wheezing, and runny nose.
Ingestion: May cause irritation to the mouth, throat, stomach, and intestines. Symptoms may include nausea and vomiting.
Skin Contact: May cause allergic reactions to sensitive areas. Symptoms may include red, itchy skin.
Eye Contact: May cause eye irritation. Symptoms may include bloodshot and watery eyes.

Numerical measures of toxicity: See the individual safety data sheets.

For more information, see the individual Safety Data Sheets.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity: See individual Safety Data Sheets.

Persistence and Degradability: See individual Safety Data Sheets.

Bioaccumulative Potential: See individual Safety Data Sheets.

Mobility in Soil: See individual Safety Data Sheets.

Other Adverse Effects: See individual Safety Data Sheets.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations.

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

Dispose of container and unused contents in accordance with federal, state and local requirements.

RCRA HAZARD CLASS: N/A

SECTION 14: TRANSPORT INFORMATION

DOT Classification: Not a DOT controlled material (United States).

Identification: Not Applicable

Special Provisions for Transport: Not available.

SECTION 15: REGULATORY INFORMATION

CERCLA Reportable Quantity:
This mixture does not contain any components with a CERCLA reportable quantity.

SARA 304 Extremely Hazardous Substances Reportable Quantity:
This mixture does not contain any components with a Section 304 extremely hazardous substance reportable quantity.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity:
This mixture does not contain any components with a Section 302 extremely hazardous substances threshold planning quantity.

SARA 311/312 Hazards:
Acute / chronic health hazards. See individual Safety Data Sheets for more information.

SARA 313:
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.

Clean Air Act:
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act:
This product does not contain any Hazardous Substances listed under the U.S. Clean Water Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. Clean Water Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307.
This product does not contain any priority pollutants related to the U.S. Clean Water Act.

TSCA List:
No substances within this mixture are subject to a Significant New Use Rule.
No substances are subject to TSCA 12(b) export notification requirements.

US State Regulations:
Massachusetts Right to Know
No components are subject to the Massachusetts Right to Know Act.
Maine Chemicals of High Concern
Product does not contain any listed chemicals
Vermont Chemicals of High Concern
Product does not contain any listed chemicals
Washington Chemicals of High Concern
Product does not contain any listed chemicals

SECTION 16: OTHER INFORMATION

Further information: The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product.

PRODUCT USE: Laboratory Use Only – RESEARCH.

DISCLAIMER: The US Department of Energy, Radiological and Environmental Sciences Laboratory provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.