1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name	MES - SODIUM SALT
Product Synonym(s)	
Chemical Family	
Chemical Formula	C6H12NaNO4S
Chemical Name	4-Morpholineethanesulfonic acid, sodium salt
EPA Reg Num	
Product Use	

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
Water	7732-18-5	50- 75%	N
4-Morpholineethanesulfonic acid, sodium salt	71119-23-8	20- 50%	N
Morpholine	110-91-8	0- 15%	Y
2-Hydroxyethanesulfonic acid, sodium salt	1562-00-1	0-15%	N
Sodium hydroxide	1310-73-2	0-1%	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview
Aqueous solution

WARNING!
CAUSES EYE IRRITATION.
CAUSES SKIN IRRITATION.
CAUSES RESPIRATORY TRACT IRRITATION.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on its composition, it is anticipated to be severely irritating to the eyes, skin and respiratory tract. Inhalation of mists or vapor may cause moderate irritation of the eyes and upper respiratory tract with effects such as blurred vision, chest pain, coughing and sore throat. Medical conditions which may be aggravated by exposure to this material include lung

disease or limited respiratory capacity.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately wash with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	NE	
Flash Point	>170 F	Flash Point Method
Flammable Limits- Upper	NE	
Lower	NE	

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

None known.

Fire and Explosive Properties

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Isolate hazard area and deny entry to unnecessary or unprotected personnel. Contain spilled liquid with sand or earth. Clean up spill immediately, observing precautions in the Personal Protection section of MSDS. Avoid runoff into storm sewers and ditches which lead to waterways.

7 HANDLING AND STORAGE

Handling

Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Keep from contact with strong

7 HANDLING AND STORAGE

oxidizing agents, strong acids.

Storage

This material is not hazardous under normal storage conditions; however, material should be stored in closed containers, in a secure area to prevent container damage and subsequent spillage. Do NOT store near strong acids.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Wear chemical goggles, a face shield, and chemical resistant clothing such as a rubber apron when splashing may occur. Rinse immediately if skin is contaminated. Remove contaminated clothing promptly and wash before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash skin thoroughly after handling.

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

Respiratory Protection

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit		Value
Morpholine		
ACGIH Skin designator	-	Y
ACGIH TWA	-	20 ppm 71 mg/m3
OSHA Skin designator	-	Y
OSHA TWA PEL	-	20 ppm 70 mg/m3
Sodium hydroxide		
ACGIH CEILING	-	2 mg/m3
OSHA TWA PEL	-	2 mg/m3

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Aqueous solution
pH	13.5
Specific Gravity	NE
Vapor Pressure	NE
Vapor Density	NE
Melting Point	NE
Freezing Point	NE
Boiling Point	212-249 F (100-120 C)
Solubility In Water	Highly Soluble
Molecular Weight	217.29

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Hazardous Polymerization

Does not occur.

Incompatibility

Oxidizing Agents
Strong Acids

Hazardous Decomposition Products

Carbon Monoxide
Sulfur Oxides

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Single exposure (acute) studies indicate that this material is slightly toxic if absorbed through the skin (rat LD50 1,350 mg/kg; dry sodium hydroxide) and corrosive to rabbit eyes and skin.
Many publications in the scientific literature confirm that this material is corrosive to all tissues. Repeated inhalation resulted in lung damage in rats. No tumors were seen in long-term animal studies. No genetic changes were observed in tests using bacteria.

No significant increases in mortality in relation to duration or intensity of exposures were reported in an epidemiologic study of a small group of workers exposed to caustic dust for 30 years or more. Massive

11 TOXICOLOGICAL INFORMATION

ingestion of this material has been implicated as causing esophageal cancer. Squamous cell carcinomas of the esophagus occurred approximately 12-42 years later in individuals who survived accidental childhood ingestion and are likely due to the tissue destruction and possible scarring of the esophagus rather than a direct effect of this material.
Morpholine
Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 1,050-1,913 mg/kg), moderately toxic if absorbed through skin (rabbit LD50 310-810 mg/kg), practically non-toxic if inhaled (rat 4-hr LC50 7.8-8.2 mg/l) and corrosive to rabbit eyes and skin.
Acute exposure by inhalation in the workplace and in controlled human studies has resulted in blurred vision and mild irritation to the skin and upper respiratory tract. No skin allergy was observed in humans or guinea pigs following repeated exposure. Following repeated oral administration, liver, kidney and stomach lining damage were observed in rats and guinea pigs; dietary administration to rats showed only reduced weight gain. Following repeated inhalation exposure, tissue damage to the lining of the nose and upper respiratory tract was observed in rats. Only irritant effects such as upper respiratory inflammation and eye damage were observed in long-term inhalation exposure studies in rats. No increase in the incidence of tumors was observed in long-term inhalation studies in rats; dietary feeding resulted in a slight increase of liver tumors in rats, but not in hamsters. No genetic changes were observed in tests using animals or cells from exposed workers. Both positive and negative results have been reported in tests using bacteria or animal cells. Nitrosation to n-nitroso-morpholine, a strong mutagen and potent liver carcinogen in multiple animal species, can occur in nitrosating environments or in the body by metabolism.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
Data from several species of fish showed a range of tolerance (brook trout > spotfin and Lake Emerald shiners > minnows > mosquitofish > goldfish) that was most likely related to changes in the pH produced by addition of sodium hydroxide to the water. The minimum lethal concentration for minnows, Mayfly larvae and Daphnia was 100 ppm and for Chironomus larvae, 700 ppm.
Morpholine
This material is practically non-toxic to Daphnia magna (24-hr EC50 100 mg/l), bluegill sunfish (96-hr LC50 350 mg/l), rainbow trout (96-hr LC50 180 mg/l), golden orfe (48-hr LC50 240 mg/l) zebrafish (96-hr LC50 >1,000 mg/l) and mosquito fish (96-hr LC0 320 mg/l). It is slightly toxic to algae (96-hr EC50 28 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Sodium Hydroxide
No data were available, but this material is a strong alkali that easily dissolves in water with resulting acid/base chemistry.

Morpholine
This material is biodegradable (91-97% after 21-days). It has a log Pow of -0.826 to -2.55 and a BCF of <0.3-0.65 in carp and medaka.

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Incineration is the recommended method for disposal observing all local, state and federal regulations.

14 TRANSPORT INFORMATION

DOT Name	Not Regulated by DOT
DOT Technical Name	
DOT Hazard Class	
UN Number	
DOT Packing Group	PG
RQ	1000 lbs (Sodium hydroxide)

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	N
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Morpholine	100 LBS	
Sodium hydroxide	1000 LBS	
Water	NE	
2-Hydroxyethanesulfonic acid, sodium salt	NE	NE
4-Morpholineethanesulfonic acid, sodium salt	NE	NE

Massachusetts Right to Know

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Morpholine
Sodium hydroxide

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Morpholine
Sodium hydroxide

Pennsylvania Environmental Hazard

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Sodium hydroxide

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Morpholine
Sodium hydroxide

16 OTHER INFORMATION

Revision Information

Revision Date	11 OCT 2004	Revision Number 5
Supercedes Revision Dated	16-NOV-2001	

Revision Summary

ATOFINA Chemicals, Inc. has changed its name to Arkema Inc.

Key

NE= Not Established NA= Not Applicable (R) = Registered Trademark

Arkema Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of Arkema Inc., Arkema Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.