



GAA LIQUID ORGANIC WASTE

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Acrylic Monomers

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	800-338-1015	8:00 to 6:00 EST

Product Name GAA LIQUID ORGANIC WASTE
Product Synonym(s)
Chemical Family MIXTURE
Chemical Formula MIXTURE
Chemical Name MIXTURE
EPA Reg Num
Product Use R&D samples for treatability testing and chemical analyses.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
Acrylic acid	79-10-7	0-80 %	Y
Acrylic acid polymer	NE	0 - 80%	Y
Methanol	67-56-1	0 - 15%	Y
Hydrazine	302-01-2	0 - 4%	Y
Monomethyl ether of hydroquinone (MEHQ)	150-76-5	0 - 3%	Y
Nitrogen	7727-37-9	0.5 - 3%	Y
Benzaldehyde	100-52-7	0 - 1%	Y
Hydroquinone	123-31-9	0 - 1%	Y
Fumaric acid	110-17-8	0 - 1%	Y
Maleic anhydride	108-31-6	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.

FOR RESEARCH AND DEVELOPMENT USE ONLY BY TECHNICALLY QUALIFIED INDIVIDUALS UNDER SECTION 5(h)(3) OF THE TOXIC SUBSTANCES CONTROL ACT. THE PROPERTIES OF THIS MATERIAL HAVE NOT BEEN FULLY INVESTIGATED. USE DUE CAUTION IN HANDLING AND USE OF THIS MATERIAL.

3 HAZARDS IDENTIFICATION

Emergency Overview

Dark brown liquid with pungent odor

DANGER!
CAUSES EYE BURNS. MAY CAUSE BLINDNESS.
CAUSES SKIN BURNS.
HARMFUL IF ABSORBED THROUGH SKIN.



HARMFUL IF SWALLOWED.
MAY CAUSE RESPIRATORY TRACT IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.
CONTAINS METHANOL WHICH MAY CAUSE EYE DAMAGE AND BLINDNESS IF SWALLOWED
PROLONGED OR REPEATED EXPOSURE CAN CAUSE LOSS OF SKIN COLOR OR SKIN BURNS
SUSPECT CANCER HAZARD. CONTAINS MATERIAL WHICH MAY CAUSE CANCER
Risk of cancer depends on duration and level of exposure

MAY CAUSE LIVER, BLOOD AND NERVOUS SYSTEM DAMAGE AFTER REPEATED EXPOSURE BASED ON ANIMAL DATA
FOR RESEARCH AND DEVELOPMENT USE ONLY BY TECHNICALLY QUALIFIED INDIVIDUALS UNDER SECTION 5(h)(3) OF THE TOXIC SUBSTANCES CONTROL ACT. THE PROPERTIES OF THIS MATERIAL HAVE NOT BEEN FULLY INVESTIGATED. USE DUE CAUTION IN HANDLING AND USE OF THIS MATERIAL.

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 slightly to moderately toxic if swallowed or absorbed through skin, slightly toxic if inhaled and corrosive to eyes and skin. Prolonged or repeated contact removes oils from the skin and may dry skin and cause irritation, redness and rash. Repeated exposure may cause an allergic skin and/or respiratory reactions. High vapor concentrations may be irritating to the eyes and respiratory tract, and may result in central nervous system (CNS) effects such as headache, dizziness, nausea, drowsiness and, in severe exposures, loss of consciousness and death. Other effects of overexposure include coughing, sneezing, vomiting, nosebleed and an intense burning sensation in the throat and, in severe cases, bronchitis and delayed pulmonary edema, liver and kidney damage and nervous system effects including loss of muscle coordination and tingling in the arms and legs.

Repeated or prolonged skin contact may cause loss of skin color (depigmentation). Direct eye contact causes irritation and eye damage including corneal discoloration, cataracts, light sensitivity and deterioration of vision. Temporary or permanent visual disturbances are commonly seen with methanol poisoning in man, though permanent loss of vision is generally associated with poisoning following ingestion. Initial visual symptoms include blurring or dimness, changes in color perception, pain and tenderness, and dilated unreactive pupils. If swallowed, this material may cause stomach irritation with CNS effects as noted above. Hydrazine is listed as a substance that may reasonably be anticipated to be a carcinogen by the National Toxicology Program (NTP) and is classified as "possibly carcinogenic to humans" (Group 2B) by the International Agency for Research on Cancer (IARC). 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 flush with 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	140F - > 200 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

When burned, the following hazardous products of combustion can occur: Oxides of carbon

A large amount of heat can be generated when monomers are exposed to a fire. Heated sealed containers can explode.

6 ACCIDENTAL RELEASE MEASURES**In Case of Spill or Leak**

Stop the leak if you can do so without risk. Ventilate the area and remove all ignition sources. Contain the spill by building a dike using absorbent material. Collect the liquid and solid absorbent into a drum approved for waste disposal. Contaminated monomer may be unstable. Add inhibitor to prevent polymerization.

The product can be neutralized with sodium bicarbonate, lime, or soda ash. CAUTION: neutralization of the acid may result in an exothermic reaction, accompanied by some spattering of unreacted material. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE**Handling**

Keep away from heat, sparks and flame. Keep container tightly closed. Use only with adequate ventilation. Do not get in eyes, on skin or on clothing. Avoid breathing vapor. Do not taste or swallow. Wash thoroughly after handling. Use grounding and bonding connection when transferring material to prevent static discharges, fire or explosion. Use spark-resistant tools.

CONTAINER HAZARDOUS WHEN EMPTY. Emptied container retains vapor and product residue. Follow labeled warnings even after container is emptied. RESIDUAL VAPORS MAY EXPLODE ON IGNITION. DO NOT CUT, DRILL GRIND OR WELD ON OR NEAR THIS CONTAINER. Improper disposal or reuse of this container may be dangerous and/or illegal.

Storage

This product should be stored in a closed container, away from direct sunlight, at ambient temperatures. Storage of this product at elevated temperatures (>30 C or >85 F) reduces the shelf-life. The typical shelf-life for this product is 12 months. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

The stability of this product should be checked periodically; typically every 90 days for bulk containers. Materials recommended for packaging include: stainless steel, aluminum, glass, HDPE, PP or PTFE.

**8 EXPOSURE CONTROLS / PERSONAL PROTECTION****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.

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.

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. Full facepiece equipment is recommended and, if used, replaces need for face shield and chemical goggles. 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
Methanol		
ACGIH Skin designator	-	Y
ACGIH STEL	-	250 ppm (328 mg/m ³)
ACGIH TWA	-	200 ppm (262 mg/m ³)
OSHA TWA PEL	-	200 ppm (260 mg/m ³)
Acrylic acid		
ACGIH Skin designator	-	Y
ACGIH TWA	-	2 ppm 5.9 mg/m ³
Benzaldehyde		
WEEL STEL	-	4 ppm 17.4 mg/m ³
WEEL TWA	-	2 ppm 8.7 mg/m ³
Hydroquinone		
ACGIH TWA	-	2 mg/m ³
OSHA TWA PEL	-	2 mg/m ³
Maleic anhydride		
ACGIH Sensitizer Designator	-	Y
ACGIH TWA	-	0.1ppm (0.4 mg/m ³)
OSHA TWA PEL	-	0.25 ppm (1 mg/m ³)
Hydrazine		
ACGIH Skin designator	-	Y
ACGIH TWA	-	0.01 ppm 0.013 mg/m ³
OSHA Skin designator	-	Y

**Hydrazine**OSHA TWA PEL - 1 ppm 1.3 mg/m³**Monomethyl ether of hydroquinone (MEHQ)**ACGIH TWA - 5 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	Dark brown liquid with pungent odor
pH	2 - 3
Specific Gravity	1
Vapor Pressure	NE
Vapor Density	NE
Melting Point	NA
Freezing Point	NE
Boiling Point	NE
Solubility In Water	NE
Evaporation Rate	NE
Percent Volatile	100

10 STABILITY AND REACTIVITY**Stability**

This material is chemically stable under normal and anticipated storage and handling conditions. However, this material can undergo hazardous polymerization. See Hazardous Polymerization below for conditions to avoid.

Hazardous Polymerization

An uncontrolled polymerization may produce a rapid release of energy with the potential for an explosion of unvented closed containers or inadequately vented containers.

Incompatibility

This material polymerizes exothermically in the presence of heat, contamination, oxygen free atmosphere, free radicals, peroxides, and inhibitor depletion liberating heat.

Hazardous Decomposition Products

Oxides of carbon can be liberated at temperatures above ambient.

11 TOXICOLOGICAL INFORMATION**Toxicological Information****Acrylic Acid**

Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 1,250-3,200 mg/kg) or inhaled (rat 4-hr LC50 3.6 mg/l), moderately toxic if absorbed through skin (rabbit LD50 295-750 mg/kg), and corrosive to eyes (rabbit) and skin (rabbit 24 hr exposure).

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No skin allergy was observed following repeated exposure to pure material. Skin allergy in humans and guinea pigs is due to an impurity that is not found in this product. Following repeated exposure to rats in the drinking water, decreased water consumption and increased kidney and testes weights were noted. In another study, irritation of the stomach with lung, nose and kidney changes were observed in rats. Following repeated skin exposure, skin irritation was noted in mice. In repeat dose inhalation studies, nasal lesions were reported in mice and rats and lung changes in rats. No tumors were noted in rats following a long-term drinking water study or in a lifetime skin painting study in mice. No birth defects were noted in the offspring of rabbits given this material by inhalation during pregnancy, even at amounts that produced toxic effects in the mother. Reduction in fertility, body weight gain, liver and spleen weights of pups were noted in rats given this material in a drinking water study. No genetic changes were noted in tests using animals, fruit flies and bacteria. Both positive and negative responses have been noted in tests using animal cells.

Methanol

Single exposure (acute) studies indicate that this material is practically non-toxic if swallowed (rat LD50 6,200-12,900 mg/kg), absorbed through skin (rabbit LD50 20 ml/kg) or inhaled (rat (4-hr LC50 64,000 ppm) and moderately irritating to rabbit eyes and skin.

Studies with primates confirm effects reported for this material in humans and implicate the production of acidosis as a major toxic response to intoxication. No adverse effects were reported in several repeated oral dosing studies with rats. Liver effects were reported in one study of rats following repeated oral exposure. No adverse effects were reported in dogs following long-term inhalation. Long-term inhalation produced no tumors in rats and mice. Exposure of pregnant rats and mice by inhalation produced birth defects in the offspring at levels which had adverse effects on the mothers. Oral dosing of pregnant rats was reported to produce behavioral changes in offspring, with structural birth defects. Genetic changes were observed in tests using animals and animal cells.

Maleic Anhydride

Single exposure (acute) studies indicate that this material is slightly to moderately toxic to rats if swallowed (LD50 481-850 mg/kg), slightly toxic to rabbits if absorbed through skin (LD50 2,620 mg/kg), and corrosive to rabbit skin and eyes.

Occupational exposure of humans to this material has been reported to cause respiratory tract irritation, chronic bronchitis, asthma and pulmonary edema. Severe eye and skin irritation and allergic contact dermatitis have also been observed. Exposure of human volunteers for short periods to 2.5 ppm or higher was extremely irritating to the eyes and nose. A few case reports have suggested that autoimmune hemolytic anemia can occur in overexposed workers.

No skin allergy was reported in guinea pigs after repeated dermal exposure to this material. Rats, hamsters and monkeys exposed to this material for six months at concentrations of 1.1, 3.3 and 9.8 mg/m³ showed nose and eye irritation, reduced weight gain, and inflammation or proliferative changes of the nasal lining at the mid and high dose groups. No other adverse effects were observed in clinical or pathological evaluations. Subchronic feeding studies in rats showed no effects at 40 mg/kg per day, but did show adverse effects on the liver and kidneys at 100 and 250 mg/kg per day. Administration of this material to rats in the diet at 10, 32 and 100 mg/kg per day for two years did not result in adverse effects. Subcutaneous injections of this material to rats for 61 weeks resulted in early deaths and local injection sarcomas. Skin painting studies of mice initiated with carcinogens showed no evidence of promotion. No effects on reproduction or survival of offspring were observed in rats treated at 20-150 mg/kg per day for three generations. Some evidence of renal effects was observed in the high-dose animals. No increase in birth defects or toxic effects on the fetus was observed in the offspring of rats administered this material orally at 30-140 mg/kg per day during the majority of gestation. No genetic changes have been seen in standard bacterial assays or in cells taken from whole animals. Chromosome aberrations have been reported following treatment of cells in culture.

Hydroquinone

Single exposure (acute) studies indicate that this material is slightly to moderately toxic if swallowed (rat LD50

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298-1,090 mg/kg), no more than moderately toxic if absorbed through skin (rat LD50 >900 mg/kg), and slightly irritating to rabbit eyes and skin.

Inhalation has been reported to cause irritation and eye damage including corneal discoloration, cataracts, light sensitivity and deterioration of vision. Studies of workers exposed in photo developing operations have demonstrated lung effects including decreased pulmonary function. This material has been reported to cause depigmentation (loss of skin color), skin irritation and allergic skin reactions following repeated exposure in the workplace. Human case reports indicate that ingestion causes tremors, vomiting and stomach pain, convulsions, a bluish color to the skin and death. Controlled human studies indicate that repeated exposure to low dose levels by ingestion causes no adverse effects. Limited human epidemiological studies showed no significant increase in cancer associated with exposure.

Depigmentation, irritation and allergy were observed in guinea pigs following repeated exposure. Eye damage and eye discoloration were observed in rabbits following repeated exposure. Following repeated exposure in the feed, aplastic anemia and tissue damage to the liver, spleen, muscle and stomach lining were observed in rats. Repeated oral administration to rats and mice produced central nervous system (CNS) effects such as tremors and convulsions, increased mortality and thyroid and liver effects (mice only). Following exposure, adverse immune system effects were noted in animals, including reduced number of cells in the spleen and bone marrow and interference with cell maturation. Following long-term administration to rats and mice, this material increased the incidence of kidney tumors (male rats only), liver tumors (female mice only) and mononuclear cell leukemia (MCL) (female rats only). The significance of MCL is questionable since this is a condition known to occur spontaneously to a high and variable extent in aged rats of this strain. In addition, all male rats and most female rats exhibited kidney damage (severe nephropathy). The International Agency for Research on Cancer (IARC) has reviewed this material and determined that it is not classifiable as to its carcinogenicity to humans (Group 3). No birth defects were noted in the offspring of rats exposed orally during pregnancy, even at doses that produced significant adverse effects in the mother. Birth defects were noted in the offspring of rabbits exposed orally during pregnancy, but only at amounts that produced significant adverse effects in the mother. No effects were noted on the ability of male or female rats to reproduce when exposed orally for 2 generations. Genetic changes were observed in tests using animals, animal cells or human cells, but not generally in tests using bacteria.

Fumaric acid

Single exposure (acute) studies indicate that this material is practically non-toxic if swallowed (rat LD50 9,300-10,700 mg/kg) or absorbed through skin (rabbit LD0 20,000 mg/kg), slightly irritating to rabbit skin and severely irritating to rabbit eyes.

No skin allergy was observed in guinea pigs following repeated exposure. Long-term oral administration to humans, rats, dogs and guinea pigs generally produced no adverse effects. In one long-term oral administration study, increased mortality and testes effects were observed in rats. No tumors were observed in mice following long-term skin application. No adverse effects on growth, reproduction or lactation in adult guinea pigs or growth in their offspring were observed following oral administration. No genetic changes were observed in tests using bacteria or animal cells, but have been observed in a test using animals.

Monomethyl ether of hydroquinone (MEHQ)

Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 1,600 mg/kg), no more than slightly toxic if absorbed through skin (rabbit LD50 >1,000 mg/kg), severely irritating to rabbit eyes and corrosive to rabbit skin (24-hr exposure, occluded).

No skin irritation or allergic skin reaction was observed in humans following repeated exposure. Application to the skin of rabbits caused minimal irritation, while application to the skin of guinea pigs produced moderate to slight irritation. Repeated application to the skin of guinea pigs caused depigmentation. Repeated application to the hamster cheek pouch caused local irritation including blisters and muscular degeneration. Repeated administration in the diet of dogs produced no significant adverse effects. The only increase in tumors produced in rats following long-term administration in the diet were forestomach tumors. Ulceration and cell

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proliferation in the forestomach were also observed. Lifetime skin application produced no tumors in mice and rabbits. No birth defects were observed in the offspring when applied to the skin of rabbits during pregnancy, although it was toxic to the developing embryo. No genetic changes were observed in tests using bacteria.

Nitrogen

This material is a simple asphyxiant. The primary hazard of liquid material is frostbite. Poisoning, which is usually associated with deep-sea divers, can lead to disorientation and irrational behavior. Human fatalities have occurred in confined spaces.

Benzaldehyde

Single exposure (acute) studies indicate that this material is slightly toxic if swallowed (rat LD50 1,300-2,850 mg/kg), no more than slightly toxic if absorbed through skin (rabbit LD50 >1,250 mg/kg), practically non-toxic if inhaled (rabbit LC50 >5.5 mg/l), and moderately irritating to rabbit eyes and skin.

Allergic skin reactions have been observed in humans and these responses may have resulted from cross-sensitization to other materials. Generally, no skin allergy has been observed in guinea pigs following repeated exposure, although one weakly positive result has been observed. Repeated inhalation exposure of rats resulted in reduced motor activity and central nervous system (CNS) effects including abnormal gait and tremor with evidence of upper respiratory tract irritation. Repeated oral administration in the feed of rats produced no adverse effects. Repeated oral administration in rats and mice resulted in early deaths, decreased weight gain and kidney and forestomach pathology in both species. Rats also showed evidence of brain damage. Long-term oral administration in rats and mice produced no adverse systemic effects or increases in tumors other than an increase in forestomach tumors in mice. No genetic changes were observed in tests using bacteria or fruit flies, but were observed in animal cells. Both positive and negative results have been observed in animals.

Hydrazine Hydrate

Single exposure (acute) studies indicate that this material is moderately toxic if swallowed (rat LD50 60-129 mg/kg) or inhaled (rat 4-hr LC50 0.75 mg/l), highly to moderately toxic if absorbed through skin (rabbit LD50 91-238 mg/kg, anhydrous hydrazine; >200 mg/kg, 48% solution), and corrosive to eyes and skin (non-corrosive in 35% solution).

Allergic skin reactions have been observed in humans. This material is listed as a substance that may reasonably be anticipated to be a carcinogen by the National Toxicology Program (NTP) and is classified as possibly carcinogenic to humans (Group 2B) by the International Agency for Research on Cancer (IARC). The NTP and IARC listings are based on their determination that there is sufficient evidence for carcinogenicity in experimental animals on the basis of studies which have shown increased tumor incidence in rats, mice and hamsters following long term administration by various routes. The main target organs following long-term exposure are the liver in rats and hamsters (drinking water), the lungs in mice (drinking water), and the nasal cavity in rats (inhalation). Additional sites have included tumors of blood cells and the thyroid. No birth defects were noted in the offspring of rodents following dermal exposure during pregnancy even at dose levels that produced toxic effects in the mother and the offspring. Genetic changes were observed in tests using bacteria, animal cells, yeast and fruit flies, but no genetic changes were observed in rodents.

12 ECOLOGICAL INFORMATION**Ecotoxicological Information****Acrylic Acid**

This material is highly toxic to algae (96-hr EC50 0.17 mg/l) and practically non-toxic to sheepshead minnow (96-hr LC50 236 mg/l). It is slightly toxic to rainbow trout (96-hr LC50 27 mg/l), saltwater mysid (96-hr LC50 97 mg/l) and *Daphnia magna* (48-hr EC50 95 mg/l).

Methanol

This material is practically non-toxic to aquatic organisms on an acute basis with LC50 values generally >100

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mg/l. Acute (96-hr) LC50 values for fish such as fathead minnow, rainbow trout, guppy, bleak and creek chub range from >8,000 to 29,400 mg/l. Acute EC/LC50 values for invertebrates and mollusca such as brown shrimp, flat and segmented worms, water fleas and snails range from >100 to >10,000 mg/l. It is practically non-toxic to green and blue-green algae (EC50's 26,900 and 28,512, respectively).

Maleic Anhydride

This material is slightly toxic to fathead minnow (LC50 84 mg/l), rainbow trout and bluegill sunfish (LC50 75 mg/l) and algae (LC50 29 mg/l). It is practically non-toxic to mosquito fish (LC50 230 mg/l) and *Daphnia magna* (LC50 330 mg/l).

Hydroquinone

This material is highly toxic to *Daphnia magna* (48-hr LC50 0.16-0.29 mg/l), fathead minnow (96-hr LC50 0.044 mg/l), rainbow trout (96-hr LC50 0.639 mg/l), golden orfe (LC50 0.15 mg/l) and zebrafish (96-hr LC50 0.17 mg/l). The 14-day EC100 for algae was 10-39.8 mg/l.

Fumaric acid

This material is practically non-toxic to zebra fish (48-hr LC 245 mg/l). It is slightly toxic to *Daphnia* (24-hr EC50 73.6 mg/l), algae (72-hr IC50 41 mg/l) and bacteria (6-hr EC10 23.2 mg/l).

Monomethyl ether of hydroquinone (MEHQ)

This material is moderately toxic to daphnia (96-hr LC50 2.2 mg/l) and no more than slightly toxic to fathead minnow (96-hr EC50 94.9-110 mg/l). In carp fed up to 400 mg/kg, no effects were seen after 95-hours. Blue-green algae exposed to 20 mg/l for 24-hours showed no toxic effects.

Benzaldehyde

This material is slightly toxic to *Daphnia magna* (LC50 50 mg/l). It is moderately toxic to channel catfish (LC50 5.4 mg/l) and bluegill sunfish (LC50 1.07 mg/l), and slightly toxic to fathead minnow (LC50 12.4 mg/l), rainbow trout (LC50 11.2 mg/l) and goldfish (LC50 13.8 mg/l). The 14-day LC50 in guppies was 3.94 mg/l. Minimal growth inhibition was observed in algae after an 8-day exposure (IC3 34 mg/l) and it is non-toxic to microbes (16-hr EC5 132 mg/l).

Hydrazine Hydrate

This material is highly to moderately toxic to *Daphnia pulex* (48-hr EC50 0.18 mg/l), *Daphnia magna* (96-hr EC50 2.3 mg/l), algae (96-hr EC50 6 ug/l), bluegill sunfish (96-hr LC50 1.2 mg/l), fathead minnow (96-hr LC50 5.98 mg/l) and guppies (96-hr LC50 3.85 mg/l).

Chemical Fate Information**Acrylic Acid**

Degradation of 81% required 28 days. The log Pow was 0.16.

Methanol

This material has been shown to be readily biodegradable in activated sludge, sewage seed and fresh and salt water dilutions. The biochemical oxygen demand (BOD) after 5 days by activated sludge was 90% of the theoretical oxygen demand (ThOD). After 20 days, the BOD was 67-97% of the ThOD in salt water and after 10 days, the BOD was 63% of the ThOD in mineralized water. The chemical oxygen demand (COD) was reported as 1.05 to 1.50% of the ThOD.

Maleic Anhydride

This material is readily biodegradable in aerobic systems.

Hydroquinone

This material is readily biodegradable (84% after 14-days) and has a low capability to adsorb in soils and sediments (log Koc 9-50; estimated). The log Pow was 0.59 with a bioconcentration factor of (BCF) of 40 in golden orfe.



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Fumaric acid

This material is readily biodegradable (98% after 21-days) and is not expected to bioaccumulate (log Pow 0.56). It is slightly adsorbed in soils and sediments (log Koc 1.52) and is rapidly degraded in air by OH radicals (half-life 7.3 hours).

Benzaldehyde

This material is readily biodegradable (66% after 14-days) and inherently biodegradable (100% after 3-days). It is not likely to bioaccumulate (log Pow 1.48).

Hydrazine Hydrate

This material is rapidly degraded in air, water and soil. Bioaccumulation is not expected to be significant due to the negative value of the octanol-water coefficient (log Pow -3.8).

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Incineration is the recommended method for disposal observing all local, state and federal regulations. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Acrylic Acid, Stabilized
DOT Technical Name	
DOT Hazard Class	8(3)
UN Number	UN2218
DOT Packing Group	PG II
RQ	5000 lbs
DOT Special Information	Subsidiary Hazard - Flammable

For Domestic Shipments:
Add Subsidiary Hazard - Toxic

15 REGULATORY INFORMATION

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

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

FOR RESEARCH AND DEVELOPMENT USE ONLY BY TECHNICALLY QUALIFIED INDIVIDUALS UNDER SECTION 5(h)(3) OF THE TOXIC SUBSTANCES CONTROL ACT. THE PROPERTIES OF THIS MATERIAL HAVE NOT BEEN FULLY INVESTIGATED. USE DUE CAUTION IN HANDLING AND USE OF THIS MATERIAL.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Methanol	5000 LBS	
Acrylic acid	5000 LBS	



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Arkema Inc.

SARA Reportable Quantities

Benzaldehyde
Hydroquinone
Maleic anhydride
Hydrazine
Monomethyl ether of hydroquinone (MEHQ)
Fumaric acid
Nitrogen
Acrylic acid polymer

CERCLA RQ	SARA TPQ
NE	
100 LBS	500/10000 LBS
5000 LBS	
1 LBS	1000 LBS
NE	
5000 LBS	
NE	NE
NE	NE

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Acrylic acid
Hydrazine
Hydroquinone
Maleic anhydride
Methanol

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremely Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Hydrazine
Hydroquinone

DEA - precursor element

This product does contain the following chemical(s), as indicated below, currently on the DEA Final Precursors and Essential Chemicals Listed Components list.

Benzaldehyde

California Prop 65 - Carcinogen

This product does contain the following chemical(s), as indicated below, currently on the California list of Known Carcinogens.

Hydrazine

Massachusetts Right to Know

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

Acrylic acid
Benzaldehyde
Fumaric acid
Hydrazine
Hydroquinone
Maleic anhydride
Methanol
Monomethyl ether of hydroquinone (MEHQ)
Nitrogen

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.

Acrylic acid
Benzaldehyde
Fumaric acid
Hydrazine
Hydroquinone
Maleic anhydride



GAA LIQUID ORGANIC WASTE

Material Safety Data Sheet

Arkema Inc.

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.

- Methanol
- Monomethyl ether of hydroquinone (MEHQ)
- Nitrogen

Pennsylvania Environmental Hazard

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

- Acrylic acid
- Fumaric acid
- Hydrazine
- Hydroquinone
- Maleic anhydride
- Methanol

Pennsylvania Right to Know

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

- Acrylic acid
- Benzaldehyde
- Fumaric acid
- Hydrazine
- Hydroquinone
- Maleic anhydride
- Methanol
- Monomethyl ether of hydroquinone (MEHQ)
- Nitrogen

Pennsylvania Special Hazard

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

- Hydrazine

16 OTHER INFORMATION

Revision Information

Revision Date 19 OCT 2004 Revision Number 7
Supersedes Revision Dated 11-OCT-2004

Revision Summary

Revised Section 8

Key

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



GAA LIQUID ORGANIC WASTE

Material Safety Data Sheet

Arkema Inc.

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.



GAA LIQUID ORGANIC WASTE

Material Safety Data Sheet

Arkema Inc.

October 19, 2004

Dear Customer:

One or more of the chemicals we are shipping you are not on the Toxic Substance Control Act (TSCA) Inventory list and is being sent to you as a research and development (R&D) chemical. In order to be exempt from Premanufacturing Notification (PMN) requirements, the EPA requires that these chemicals be used solely for R&D and that all research is supervised by a "technically qualified individual" as defined in 40 C.F.R. 720.3(ee) (see below).

The chemical, physical, and toxicological properties of these chemicals may not have been fully investigated. Use due caution in the handling of this material and follow appropriate good industrial hygiene and safety precautions to control exposure. Consult the enclosed (attached) Material Safety Data Sheet (MSDS) for additional information.

Because the conditions of handling and use are beyond our control, we make no guarantee of results and assume no liability for injuries, damages, or penalties resulting from the use whether or not our suggestions are followed. Such recommendations are not to be taken as a license to operate under or to infringe any patent.

Very Truly Yours,

Director, Regulatory Affairs and Product Safety-
Arkema Inc.

Acrylic Monomers

40 C.F.R. 720.3(ee): Technically qualified individual means a person or persons (1) who, because of education, training, or experience, or a combination of these factors, is capable of understanding the health and environmental risks associated with the chemical substance which is used under his or her supervision, (2) who is responsible for enforcing appropriate methods of conducting scientific experimentation, analysis, or chemical research to minimize such risks, and (3) who is responsible for the safety assessments and clearances related to the procurement, storage, use, and disposal of the chemical substance required within the scope of conducting a research and developmental activity.