

**Chemical Fact Sheet****Quaternary O**

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**Introduction**

Chemical Name: 2(8-Heptadecenyl)-4,5-dihydro-1,3-bis(2-hydroxy-ethyl)-1H-imidazolium chloride

Synonym/Trade name: Quaternary O

CAS Number:

RTECS Number:

Molecular Formula:  $C_{24}H_{47}N_2O_2Cl$

Molecular Weight: 431.105

**Use**

Quaternary O is a high molecular weight quaternary ammonium surface active agent (cationic) of the imidazolium type with a  $C_{17}$  alkyl radical. It has the physical appearance of axle grease and is generally diluted 16:1 with water. It was manufactured by Geigy Industrial Chemicals in the '60's and '70's for mining purposes, but was found to be an excellent surfactant for washing foraminifera by numerous paleontology laboratories as a substitute for Varsol. Geigy has not manufactured this chemical since the late 1970's. Some original Quaternary O still exists and is somewhat hoarded by various companies and researchers. Some suitable substitutes exist. One surfactant is a Coco Betaine Sulfate and acts very similarly to the Quaternary O. It is called Amine QO and is diluted 16:1 with water just as the original.

**Standard Procedure**

1. Put the rocks into a pot.
2. Fill the pot with water about three quarters of the way full and make sure that all the rocks are covered.
3. Add ca. 5 ml of Quaternary O solution to the pot.
4. Turn on the hot plate.
5. Put the pot on the hot plate and let it boil for a day. Make sure to check the pot periodically so that the rocks are always covered with water and so that it doesn't boil dry.
6. After letting the rocks boil in the Quaternary O for a day, you need to boil out the Quaternary O.
7. Pour out the water using a sieve so that you can catch any sediments that may come out with the water.
8. Rinse the soap out of the sieve and replace the sediments into the pot.
9. Fill the pot with water about three quarters of the way full and make sure that all the rocks are covered.
10. Boil for an hour and then repeat steps 7 to 10 until all of the Quaternary O is boiled out.
11. Pour out all of the sediments that were boiled out of the rocks into a set of sieves so that you can sort the sediments by size.
12. Let the sediments in the sieves dry.
13. Empty the sediments from the sieves into containers and mark what the sediments are and their size on the container.

**Chemical Fact Sheet****Quaternary O****Hazards**

Quaternary O is an irritant to the skin, eyes, mouth, and respiratory tract. It is an organic compound and should be stored away from strong oxidizing agents. The container must be kept undamaged and closed.

**Safety Precautions**

**Read the attached Material Safety Data Sheet (MSDS) provided from the manufacturer prior to using this chemical.**

People using Quaternary O should follow all safety procedures. The boiling procedure should be performed in a fume hood and workers should wear protective equipment that includes a lab coat, closed-toe shoes, chemically resistant gloves, and safety glasses.

Users should wash their hands after removing their gloves, even if they are certain the gloves weren't punctured, to remove any residue that may have contacted the skin.

An emergency eyewash and shower should be accessible nearby.

**Emergency Exposure Procedures**

In case of contact with the eyes, immediately flush them with copious amounts of cold water for at least 15 minutes. For skin contact, immediately wash the affected area with soap and copious amounts of cold or cool water. If respiratory irritation occurs from inhaling vapors move them to an area where they can breathe fresh air. After any exposure, refer to the instructions for medical consultation in the Laboratory Chemical Safety Plan (LCSP) and be sure to provide the MSDS to the attending physician.

**Spill Response Procedures**

Be prepared to safely remediate small spills by having a spill kit on hand at all times, understanding the hazards, and using proper personal protective equipment (gloves, safety glasses, lab coat, etc.).

**Large or Small Spill**

Notify all others in the room that the spill has occurred. Quaternary O is highly viscous. Absorbents may only be necessary if the substance is a dilute solution. Evacuate the room or immediate area. Post a sign warning others not to enter the area.

For large spills it may be necessary to call the University Office of Environmental, Health, and Safety Management (855-6311) for assistance with the cleanup. Provide any assistance and information you can to the spill responders.

*For small spills use the Spill Kit provided by UOEHS or other suitable spill absorbent. Spread the absorbent material around the perimeter and on top of the spilled material to confine and contain the spill. Collect the saturated spill absorbent and place in the five gallon bucket or other suitable container. Collect broken glass using the plastic dustpan and broom only. Place all solid waste, broken glass, paper towels, in the spill kit bucket and close the lid. Attach a Hazardous Chemical Waste Tag to the bucket and call UOEHS for a pickup and request a new spill kit*



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#### Material Safety Data Sheet

The following Material Safety Data Sheet was prepared based on a facsimile of CIBA-GEIGY Material Safety Data Sheet dated 3/9/81.

<b>Material Safety Data Sheet</b>		<b>U.S. Department of Labor</b>	
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.		Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072	
IDENTITY (as Used on Label and List) Quaternary O		<i>Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.</i>	
<b>Section I</b>			
Manufacturer's name <b>CIBA-GEIGY Corporation, Plastics and Additives</b>		Emergency Telephone Number <b>(914) 478-8131</b>	
Address (Number, Street, City, State and ZIP Code) <b>Saw Mill River Road, Ardsley, NY 10502</b>		Telephone Number for Information <b>NA</b>	
		Date Prepared <b>3/9/81</b>	
		Signature of Preparer (optional) <b>Bruce A. Schwemmer</b>	
<b>Section II—Hazardous Ingredients/Identity Information</b>			
Hazardous Components (Specific Chemical Identity, Common Name(s)) <b>Common/Trade Name: Quaternary O</b>		OSHA PEL	ACGIH TLV
		Other Limits Recommended	% (optional)
<b>Chemical Name: 2(8-Heptadecenyl)-4,5-dihydro-1,3-bis(2-hydroxy-ethyl)-1H-imidazolium chloride</b>			
<b>Formula: C<sub>24</sub>H<sub>47</sub>N<sub>2</sub>O<sub>2</sub>Cl</b>			
<b>ACGIH TLV: None established</b>			
<b>Section III—Physical/Chemical Characteristics</b>			
Boiling Point		Specific Gravity (H <sub>2</sub> O = 1)	
Vapor Pressure (mm Hg)		Percent Volatile by Volume (%)	<b>&lt;0.5</b>
Vapor Density (AIR = 1)		Evaporation Rate (Butyl Acetate = 1)	
Solubility in Water (25°C)	<b>High</b>	pH (1% aqueous solution)	<b>4.6-8.0</b>
Appearance and Odor <b>Amber colored paste, practically odorless</b>			
<b>Section IV—Fire and Explosion Hazard Data</b>			
Flash Point (Method Used)	<b>&gt; 100°C</b>	Flammable Limits	LEL UEL
Extinguishing Media <b>Carbon dioxide, foam, water</b>			
Special Fire Fighting Procedures			
<b>Firefighters should wear self-contained breathing apparatus</b>			
Unusual Fire and Explosion Hazards			
<b>None known</b>			
(Reproduce locally)		OSHA 174 Sept. 1985	



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<b>Section V—Reactivity Data</b>			
Stability	Unstable		Conditions to Avoid
	Stable	X	
Incompatibility ( <i>Materials to Avoid</i> ) <b>None known</b>			
Hazardous Decomposition or Byproducts <b>None known</b>			
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	
<b>Section VI—Health Hazard Data</b>			
Route(s) of Entry	Inhalation?	Skin?	Ingestion?
Health Hazards ( <i>Acute and Chronic</i> )			
<b>Caution: May cause skin and eye irritation, especially if contact is prolonged</b>			
<b>May cause nose and throat irritation if inhaled</b>			
Carcinogenicity	NTP?	IARC Monographs?	OSHA Regulated?
Signs and Symptoms of Exposure			
Medical Conditions Generally Aggravated by Exposure			
Emergency and First Aid Procedures			
Skin contact: Wash promptly with mild soap and water.			
Eye contact: Flush eyes for at least 15 minutes; seek medical attention.			
Inhalation: Remove to fresh air.			
<b>Section VII—Precautions for Safe Handling and Use</b>			
Steps to Be Taken in Case Material Is Released or Spilled			
<b>Shovel up (or absorb solutions with sand) and place into a closeable container for disposal.</b>			
<b>Wear protective equipment specified below.</b>			
<b>Flush residue well with water.</b>			
Waste Disposal Method	Burial or incineration in approved sites or facilities.		
<b>Not a hazardous waste under RCRA [40 CFR 261].</b>			
Precautions to Be Taken in Handling and Storing			
<b>Avoid all skin, eye, and inhalation contact. Do not taste.</b>			
<b>Keep container closed during transport and when not in use.</b>			
Other Precautions			
<b>For industrial use only.</b>			
<b>Section VII—Control Measures</b>			
Respiratory Protection ( <i>Specify Type</i> )			
Ventilation	Local Exhaust	Special	
	<b>Use only with adequate ventilation.</b>		
	Mechanical ( <i>General</i> )	Other	
Protective Gloves		Eye Protection	
Other Protective Clothing or Equipment <b>if contaminated, wash clothing prior to reuse.</b>			
Work/Hygienic Practices			

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein.

This Material Safety Data Sheet was prepared 11/23/04 and based on a facsimile of CIBA-GEIGY Material Safety Data Sheet dated 3/9/81. 2142h D-10412.A