



## MATERIAL SAFETY DATA SHEET

Crude Oil (sour)

MSDS No. 6608

## EMERGENCY OVERVIEW

## CAUTION!

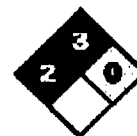
**FLAMMABLE LIQUID - MAY EVOLVE TOXIC AND FLAMMABLE HYDROGEN SULFIDE GAS - SLIGHT TO MODERATE IRRITANT - EFFECTS CENTRAL NERVOUS SYSTEM - HARMFUL OR FATAL IF SWALLOWED**

High fire hazard. Keep away from heat, spark, open flame, and other ignition sources.

HYDROGEN SULFIDE (toxic gas) may be released. High concentration may cause immediate unconsciousness - death may result unless victim is promptly and successfully resuscitated. Hydrogen sulfide causes eye irritation.

If ingested, do NOT induce vomiting, as this may cause chemical pneumonia (fluid in the lungs). Contact may cause eye, skin and mucous membrane irritation. Avoid prolonged breathing of vapors or mists. Inhalation may cause irritation, anesthetic effects (dizziness, nausea, headache, intoxication), and respiratory system effects.

Long-term exposure may cause effects to specific organs, such as to the liver, kidneys, blood, nervous system, and skin. Contains benzene, which can cause blood disease, including anemia and leukemia.



NFPA 704 (Section 16)

## 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

Hess Corporation  
1 Hess Plaza  
Woodbridge, NJ 07095-0961

EMERGENCY TELEPHONE NUMBER:  
COMPANY CONTACT (business hours):  
MSDS Internet Website:

CHEMTREC (800) 424-8300  
Corporate EHS 732-750-6000  
[www.hess.com](http://www.hess.com)

SYNONYMS: Crude Petroleum; Sour Crude  
See Section 16 for abbreviations and acronyms.

## 2. COMPOSITION and CHEMICAL INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Petroleum Oil (8002-05-9)	100
Hydrogen Sulfide (H <sub>2</sub> S) (7783-06-4)	< highly variable - see below >
Benzene (71-43-2)	Variable AP 0.1 to 1.0

A natural product derived from various oil production field primarily consisting of a complex combination of paraffinic and aromatic hydrocarbons and small amounts of nitrogen and sulfur compounds.

Crude oils are generally referred to as "sour" if they can release dissolved hydrogen sulfide (H<sub>2</sub>S) which could result in a hazardous condition. The amount of dissolved H<sub>2</sub>S can vary considerably with the crude oil source. Some sour crude oils can have an appreciable percentage of H<sub>2</sub>S.

## 3. HAZARDS IDENTIFICATION

**MATERIAL SAFETY DATA SHEET****Crude Oil (sour)****MSDS No. 6608****EYES**

Contact with eyes may cause moderate to severe irritation.

**SKIN**

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are exposed repeatedly. Rare, precancerous warts on the forearms, backs of hands and scrotum have been reported from prolonged or repeated skin contact.

**INGESTION**

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

**INHALATION**

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

**WARNING:** Irritating and toxic hydrogen sulfide gas may be found in confined vapor spaces. Greater than 15 - 20 ppm continuous exposure can cause mucous membrane and respiratory tract irritation. 50 - 500 ppm can cause headache, nausea, and dizziness, loss of reasoning and balance, difficulty in breathing, fluid in the lungs, and possible loss of consciousness. Greater than 500 ppm can cause rapid or immediate unconsciousness due to respiratory paralysis and death by suffocation unless the victim is removed from exposure and successfully resuscitated.

The "rotten egg" odor of hydrogen sulfide is not a reliable indicator for warning of exposure, since olfactory fatigue (loss of smell) readily occurs, especially at concentrations above 50 ppm. At high concentrations, the victim may not even recognize the odor before becoming unconscious.

**CHRONIC EFFECTS and CARCINOGENICITY**

Similar products produced skin cancer and systemic toxicity in laboratory animals following repeated applications. This product contains polynuclear aromatic hydrocarbons which have been shown to be carcinogenic in laboratory animals after repeated and prolonged skin contact. The significance of these results to human exposures has not been determined - see Section 11, Toxicological Information.

Contains benzene, a regulated human carcinogen. Benzene has the potential to cause anemia and other blood diseases, including leukemia, after repeated and prolonged exposure.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE**

Irritation from skin exposure may aggravate existing open wounds, skin disorders, and dermatitis (rash). Pre-existing chronic respiratory disease, liver or kidney dysfunction, or blood, cardiovascular and central nervous system disorders may be aggravated by exposure.

**4. FIRST AID MEASURES****EYES**

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

**SKIN**

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Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or waterless hand cleanser. Obtain medical attention if irritation or redness develops. Thermal burns require immediate medical attention depending on the severity and the area of the body burned.

**INGESTION**

**DO NOT INDUCE VOMITING.** Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

**INHALATION**

Remove person to fresh air. If person is not breathing provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

**5. FIRE FIGHTING MEASURES****FLAMMABLE PROPERTIES:**

**FLASH POINT:** < 73 to > 200 °F (< 23 to > 93 °C)

**AUTOIGNITION TEMPERATURE:** N/D

**OSHA/NFPA FLAMMABILITY CLASS:** 1B (flammable liquid)

**LOWER EXPLOSIVE LIMIT (%):** N/D

**UPPER EXPLOSIVE LIMIT (%):** N/D

**FIRE AND EXPLOSION HAZARDS**

Flash point and explosive limits are highly dependent on the crude oil source. Treat as an OSHA/NFPA flammable liquid unless otherwise indicated. Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

**EXTINGUISHING MEDIA**

**SMALL FIRES:** Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or Halon.

**LARGE FIRES:** Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

**FIRE FIGHTING INSTRUCTIONS**

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

See Section 16 for the NFPA 704 Hazard Rating.

**6. ACCIDENTAL RELEASE MEASURES**

**MATERIAL SAFETY DATA SHEET****Crude Oil (sour)****MSDS No. 6608****ACTIVATE FACILITY SPILL CONTINGENCY or EMERGENCY PLAN.**

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Product may release substantial amounts of flammable vapors and gases (e.g., methane, ethane, and propane), at or below ambient temperature depending on source and process conditions and pressure.

Carefully contain and stop the source of the spill, if safe to do so. Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection - do not discharge solid water stream patterns into the liquid resulting in splashing.

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

**7. HANDLING and STORAGE****HANDLING and STORAGE PRECAUTIONS**

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

**STORAGE PRECAUTIONS**

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks in Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Hydrogen sulfide may accumulate in tanks and bulk transport compartments. Consider appropriate respiratory protection (see Section 8). Stand upwind. Avoid vapors when opening hatches and dome covers. Confined spaces should be ventilated prior to entry.

**WORK/HYGIENIC PRACTICES**

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent on the skin. Do not use gasoline or solvents (naphtha, kerosene, etc.) for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

**Naturally Occurring Radioactive Materials (NORM):**

Industry experience indicates that this material may contain small amounts of naturally-occurring uranium, thorium, and their decay products (NORM) which can accumulate in oil production and process equipment, particularly the equipment handling the water associated with crude oil production. Scales, other deposits, and sludges from this equipment may have a significant accumulation of NORM. Gamma



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radiation above background may be detected external to equipment contaminated with NORM. Production equipment should be assessed for external gamma radiation; access may need to be restricted in accordance with OSHA 29 CFR 1910.96 during operation. Such equipment should also be assumed to be internally contaminated with long half-life decay products that emit alpha radiation, which is a hazard if inhaled or ingested. Unless measurements indicate otherwise, steps should be taken to minimize skin and inhalation exposure to NORM dusts/mists by wearing personal protective clothing (such as disposable Tyvek® (DuPont)), utilizing respiratory protection (minimum of HEPA filter), and practicing good personal hygiene. Please refer to API Bulletin E2, "Bulletin on Management of Naturally Occurring Radioactive Materials in Oil and Gas Production," April 1, 1992, for additional information on managing NORM.

**8. EXPOSURE CONTROLS and PERSONAL PROTECTION****EXPOSURE LIMITS**

Components (CAS No.)	Source	Exposure Limits	Note
		TWA/STEL	
Petroleum Oil (8002-05-9)	OSHA ACGIH	PEL = 5 mg/m <sup>3</sup> as mineral oil mist TLV = 5 mg/m <sup>3</sup> as mineral oil mist Note: Sum of 15-NTP polynuclear aromatic hydrocarbons 0.005 mg/m <sup>3</sup>	A1
Hydrogen Sulfide (H <sub>2</sub> S) (7783-06-4)	OSHA ACGIH	PEL = 20ppm; STEL = 50 ppm TLV = 10 ppm; STEL = 15 ppm	2006 NOIC 1/5 ppm
Benzene (71-43-2)	OSHA ACGIH	PEL = 1ppm; STEL = 5 ppm TLV = 0.5 ppm; STEL = 2.5 ppm	A1; skin; BEI

**ENGINEERING CONTROLS**

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

**EYE/FACE PROTECTION**

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

**SKIN PROTECTION**

Gloves constructed of nitrile or neoprene are recommended. Chemical protective clothing such as of E.I. DuPont Tyvek-Saranex 23®, Tychem®, Barricade® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

**RESPIRATORY PROTECTION**

If hydrogen sulfide hazard is present (that is, exposure potential above H<sub>2</sub>S permissible exposure limit), use a positive-pressure SCBA or Type C supplied air respirator with escape bottle.

Where it has been determined that there is no hydrogen sulfide exposure hazard (that is, exposure potential below H<sub>2</sub>S permissible exposure limit), a NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.



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A NIOSH -approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.

**9. PHYSICAL and CHEMICAL PROPERTIES****APPEARANCE**

Variable depending on its source; typical is a thick, dark yellow to brown or greenish black liquid

**ODOR**

A characteristic, petroleum/asphalt-type odor

Hydrogen sulfide ( $H_2S$ ) has a rotten egg "sulfurous" odor. This odor should not be used as a warning property of toxic levels because  $H_2S$  can overwhelm and deaden the sense of smell. Also, the odor of  $H_2S$  in heavy oils can easily be masked by the petroleum-like odor of the oil. Therefore, the smell of  $H_2S$  should not be used as an indicator of a hazardous condition - a  $H_2S$  meter or colorimetric indicating tubes are typically used to determine the concentration of  $H_2S$ .

**BASIC PHYSICAL PROPERTIES**

The properties of crude oil are highly variable depending on its source.

BOILING RANGE: AP 100 - 1000+ °F (> 260 °C)

VAPOR PRESSURE: Variable

VAPOR DENSITY (air = 1): 3 - 5 typical

SPECIFIC GRAVITY ( $H_2O$  = 1): AP 0.7 to 0.9 (varies)

PERCENT VOLATILES: Variable

EVAPORATION RATE: Variable

SOLUBILITY ( $H_2O$ ): Insoluble to slightly soluble

**10. STABILITY and REACTIVITY**

**STABILITY:** Stable. Hazardous polymerization will not occur.

**CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS**

Material is stable under normal conditions. Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources. Keep away from strong oxidizers.

**HAZARDOUS DECOMPOSITION PRODUCTS**

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

**11. TOXICOLOGICAL PROPERTIES****CHRONIC EFFECTS AND CARCINOGENICITY**

Carcinogenicity: OSHA: NO IARC: NO NTP: NO ACGIH:1997 NOIC: A1

Dermal carcinogenicity: positive - mice

Studies have shown that similar products produce skin tumors in laboratory animals following repeated applications without washing or removal. The significance of this finding to human exposure has not been determined. Other studies with active skin carcinogens have shown that washing the animal's skin with soap and water between applications reduced tumor formation.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow).



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and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

## MUTAGENICITY (genetic effects)

Some crude oils and crude oil fractions have been positive in mutagenicity studies.

## 12. ECOLOGICAL INFORMATION

Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations.

## 13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

## 14. TRANSPORTATION INFORMATION

DOT PROPER SHIPPING NAME:

DOT HAZARD CLASS and PACKING GROUP:

DOT IDENTIFICATION NUMBER:

DOT SHIPPING LABEL:

PETROLEUM CRUDE OIL

3, (Determine FP to accurately determine packing group)

UN 1267

FLAMMABLE LIQUID

PLACARD:



## 15. REGULATORY INFORMATION

### U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other regulations at the state and/or local level. Consult those regulations applicable to your facility/operation.

### CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (essentially any surface water, including certain wetlands) or adjoining shorelines sufficient to cause a visible sheen or deposit of a sludge or emulsion must be reported immediately to the National Response Center (1-800-424-8802) as required by U.S. Federal Law. Also contact appropriate state and local regulatory agencies as required.

### CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, refined, and unrefined petroleum products and any indigenous components of such. However, other federal reporting requirements (e.g., SARA Section 304 as well as the Clean Water Act if the spill occurs on navigable waters) may still apply.

### SARA SECTION 311/312 - HAZARD CLASSES

ACUTE HEALTH	CHRONIC HEALTH	FIRE	SUDDEN RELEASE OF PRESSURE	REACTIVE
X	X	X	"	"

### SARA SECTION 313 - SUPPLIER NOTIFICATION

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372:

INGREDIENT NAME

CONCENTRATION PERCENT BY WEIGHT



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Benzene

CAS NUMBER: 71-43-2

&lt; 0.1 to 2

**CANADIAN REGULATORY INFORMATION (WHMIS)**

Class B, Division 2 (flammable liquid)

Class D, Division 1A (Very toxic, acute)

Class D, Division 1B (Very toxic by other means)

**CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS**

This product contains the following chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

INGREDIENT NAME (CAS NUMBER)	Date Listed
Benzene	2/27/1987

**NFPA® HAZARD RATING**

HEALTH: 2  
FIRE: 3  
REACTIVITY: 0

Refer to NJPA 704 "Identification of the Fire Hazards of Materials" for further information

**HMIS® HAZARD RATING**

HEALTH: 3 \* Slight  
FIRE: 3 Moderate  
Physical: 0 Negligible  
\* Chronic

**SUPERSEDES MSDS DATED: 02/24/2000****ABBREVIATIONS:**

AP = Approximately    < = Less than    > = Greater than  
N/A = Not Applicable    N/D = Not Determined    ppm = parts per million

**ACRONYMS:**

ACGIH	American Conference of Governmental Industrial Hygienists	NIOSH	National Institute of Occupational Safety and Health
AIHA	American Industrial Hygiene Association	NOIC	Notice of Intended Change (proposed change to ACGIH TLV)
ANSI	American National Standards Institute (212) 642-4900	NTP	National Toxicology Program
API	American Petroleum Institute (202) 682-8000	OPA	Oil Pollution Act of 1990
CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act	OSHA	U.S. Occupational Safety & Health Administration
DOT	U.S. Department of Transportation [General info: (800) 467-4922]	PEL	Permissible Exposure Limit (OSHA)
EPA	U.S. Environmental Protection Agency	RCRA	Resource Conservation and Recovery Act
HMIS	Hazardous Materials Information System	REL	Recommended Exposure Limit (NIOSH)
IARC	International Agency For Research On Cancer	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
MSHA	Mine Safety and Health Administration	SCBA	Self-Contained Breathing Apparatus
NFPA	National Fire Protection Association (617)770-3000	SPCC	Spill Prevention, Control, and Countermeasures
		STEL	Short-Term Exposure Limit (generally 15 minutes)





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TLV     Threshold Limit Value (ACGIH)  
TSCA    Toxic Substances Control Act  
TWA     Time Weighted Average (8 hr.)

WEEL    Workplace Environmental Exposure  
          Level (AIHA)  
WHMIS   Canadian Workplace Hazardous  
          Materials Information System

**DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES**

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.