

GHS Safety Data Sheets

The Mystery of Lyle and Louise Forensic Fire Debris Analysis

This document contains GHS safety data sheets for the following kit items:

- Heptane Spiked Carpet: Reference Sample
- Undecane Spiked Carpet: Reference Sample

Safety Data Sheet Crosscutting Concepts, LLC · P.O. Box 349 · Huntington, WV 25708 Phone: 888-221-4344 · Fax: 888-221-4344, Ext. 804

	Section 1	- Chemical Product and Company Identification
Name: Heptane		
Common Synon	yms: n-heptane, di	propyl methane, gettysolve-C, heptyl hydride
Molecular Weig	ht: 100.21 g/mole	Chemical Formula: C7H16 Chemtrec Phone: 800-424-9300
National Respon	nse Center: 800-424	4-8802
Product Use: Sa	mple for Analysis	
Product Use: Sa	ample for Analysis	
		Section 2 - Hazard Identification
FLAMMABLE	LIQUID Category	2
DANGER: High	ily flammable liqui	d and vapor
NFPA Ratings	s: Health: 1 Flam	nability: 3 Reactivity: 1 Other: Oxidizer
Emergency Ove	rview	
WARNING! FLAM	MABLE LIQUID AN	D VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES
RRITATION TO S	SKIN, EYES, AND RE	SPIRATORY TRACT. AFFECTS THE CENTRAL NERVOUS SYSTEM.
nhalation: Inha	lation of vapors ma	ay cause irritation to respiratory system. May produce light
neadedness, diz	ziness, muscle inco	ordination, loss of appetite, and nausea. Inhalation of high vapor
concentrations i	may cause Central I	Nervous System depression resulting in dizziness, narcosis, and
Inconsciousnes	S.	
ngestion: Swall	owing large amoun	ts may be harmful. This material can get into the lungs during
wallowing or vo	omiting resulting in	lung inflammation and other lung injury.
Skin Contact: M	ay cause irritation,	prolonged or repeated contact may dry the skin. Symptoms may
nclude redness,	burning, and dryin	ig and cracking of skin, burns and other skin damage. Passage of this
material into the	e body through the	ion including stinging tearing pain and reduces
Chronic Exposure	ay cause mild irritat	non including schiging, tearing, pain, and redness.
Laronic Exposu	re: The substance n	hav be toxic to lungs, peripheral nervous system, upper
espiratory tract,	, skin, central nervo	us system (CNS). Repeated of protonged exposure to the substance
Aggravation of	Bro-ovicting Condit	ions: Persons with pre-existing skin disorders or impaired pulmonar
Aggravation of t	more susceptible	to the effects of this substance. Individuals with preexisting heart
disorders maybe	e more	to the effects of this substance, individuals with preexisting heart
uscentible to a	rhythmize if expos	ed to high concentrations of this material
Target Organs	Overexposure to t	his material or its components has been suggested as a cause of mild
reversible kidne	v effects, effects on	hearing, and central nervous system damage.
	Section	3 - Composition / Information on Ingredients
Ingredient	CAS No.	Percent
Heptane	142-82-5	<100
		Section 4 - First Aid Measures
Inhalation: Rem	ove to fresh air. If	not breathing, provide artificial respiration. If breathing difficulty is
experienced, pr	ovide oxygen. Imm	ediately seek medical attention if symptoms appear.
Ingestion: DO N	OT INDUCE VOMIT	ING. DO NOT GIVE LIQUIDS, Obtain immediate medical attention. If

Skin Contact: Remove contaminated clothing and shoes. Immediately flush affected skin with large amounts of water for a minimum of 15 minutes and then wash with soap and water. Cover the irritated skin with emollient. Obtain immediate medical attention if irritation, blisters, or redness develop. **Eye Contact:** Immediately flush eyes with copious quantities of water for at least 15 minutes, holding open eyelids to ensure adequate flushing. Seek immediate medical attention if persistent irritation occurs.

Section 5 - Fire-Fighting Measures

Flash Point: -4 °C (24.8 °F)

Auto Ignition Temperature: 203.89 °C (399 °F)

Flammability Limits in Air: 1.05-6.7 % (V)

Products of Combustion: CO, CO2

Flammable Liquid and Vapor!

Explosion: Slightly explosive in presence of heat. Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Fire Extinguishing Media: Dry chemical, foam, or carbon dioxide.

Special Information: Flaming occurs when liquid chlorine in n-Heptane is added to red phosphorous. In the event of a fire, wear full protective clothing and approved self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode.

Section 6 - Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. If possible, remain uphill and upwind from spill. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Section 7 - Handling and Storage

Do not breathe gas/fumes/ vapor/spray. Handle as a combustible liquid: keep away from heat, sparks, and open flame. Protect against physical damage. During transfer containers should be bonded and grounded to reduce the possibility of static-initiated fire or explosion. Possibility of static charge accumulation increases in cold temperature, low humidity conditions. Store in approved, vented containers in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. Separate from incompatibles. Store and handle only in non-smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death. Keep containers closed when not in use.

Section 8 - Exposure Controls / Personal Protection

Exposure Limits

TWA(ppm) STEL(ppm)

Heptane ACGIH 400 500

Ventilation System: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because

it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved): If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9 - Physical and Chemical Properties

ppearance: Clear, colorless liquid

Odor: Mild, hydrocarbon and gasoline-like.

Solubility: Soluble in diethyl ether and alcohol. Insoluble in water. Solubility in Chloroform, Petroleum Ether,

Ether, Acetone: >10 %.

Specific Gravity: 0.684 at 20 °C (68 °F) Volatiles: 100 % Boiling Point: 98.4 °C (209.1 °F) Melting Point: -90.7 °C (-131.3 °F)

Vapor Density (Air=1): 3.5

Vapor Pressure: 5.3 kPa at 20 °C (68 °F) Evaporation Rate (n-butylacetate=1): 2.80

Section 10 - Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, and non-combusted hydrocarbons (smoke).

Hazardous Polymerization: Will not occur.

Incompatibilities: Oxidizing agents, alkalis, and strong acids.

Corrosivity: Not considered to be corrosive for metals or glass.

Conditions of Instability: Heat, flames, ignition sources and incompatibles Section 11- Toxicological Information

Toxicological Data

Acute Dermal LD50 (Rabbits): 2000 mg/kg

Acute Oral LD50 (Rats): 15000 mg/kg

Inhalation LC50 (Rats): Not Available

Chronic Effects on Humans: May cause damage to the following organs: lungs, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS).

Section 12 - Ecological Information

Environmental Fate: Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations. When released into the soil, this material may biodegrade to a moderate extent, but is not expected to leach into groundwater and quickly evaporates. When released into water, this material may biodegrade to a moderate extent, but is expected to quickly evaporate. This

material has an estimated bioconcentration factor (BCF) of greater than 100. This material has a log octanol-water partition coefficient of greater than 3.0. This material may bioaccumulate to some extent. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. This material is expected to have a half-life between 1 and 10 days when released into the air

Environmental Toxicity: No information found.

Section 13 - Disposal Considerations

Waste must be disposed of in accordance with federal, state and local environmental control regulations. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA 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. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14 - Transport Information

Domestic (Land, D.O.T.), International (Water, I.M.O., Air, I.C.A.O.) Proper Shipping Name: HEPTANES Hazard Class: 3 UN/NA: UN1206 Packing Group: II

Section 15 - Regulatory Information

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

Product and its constituents are present on the EPA TSCA Inventory. 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.

Connecticut Hazardous Material Survey.: n-heptane Illinois Toxic Substances Disclosure to Employee Act: n-heptane

Rhode Island RTK Hazardous Substances: n-heptane

Pennsylvania RTK: n-heptane

Minnesota: n-heptane

Massachusetts RTK: n-heptane

Massachusetts Spill List: n-heptane

New Jersey: n-heptane

California Director's List of Hazardous Substances: n-heptane

TSCA 8(b) Inventory: n-heptane

TSCA 4(a) Proposed Test Rules: n-heptane

TSCA 8(d) H and S data Reporting: n-heptane

Other Regulations

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications

WHMIS: CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

CLEAN WATER ACT (OIL SPILLS)

Any spill or release of this product to "navigable waters" (surface water, including 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. SARA SECTION 311/312 - HAZARD CLASSES Fire hazard, acute health hazard.

Section 16 - Other Information

Updated May 29, 2015

WHMIS:

This SDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR.

The above information has been developed based upon currently available scientific data. New information may be developed from time to time which may render the conclusions of this report obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or for the consequences of its use or misuse. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Crosscutting Concepts, LLC shall not be held liable for any damage resulting from handling or from contact with the above product.

Safety Data Sheet Crosscutting Concepts, LLC · P.O. Box 349 · Huntington, WV 25708 Phone: 888-221-4344 · Fax: 888-221-4344, Ext. 804

Name: Undecane Common Synonyms: Hendecane Common Synonyms: Hendecane Molecular Weight: 156.31 g/mole National Response Center: 800-424-8802 Product Use: Sample for Analysis ELAMMABLE LIQUID Category 2 DANGER: Highly flammable liquid and vapor NFPA Ratings: Health: 3 Flammability: 2 Reactivity: 0 Other: Oxidizer Emergency Overview WARNINGI FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. Inhalation: Inhalation of vapors may cause irritation to respiratory system. May be harmful if inhale Ingestion: Swallowing large amounts may be harmful and presents an aspiration hazard. This mater an get into the lungs during swallowing or vomiting resulting in lung inflammation and other lung injury. May cause irritation, prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Passage of material into the body through the skin is possible is large volumes. Eye Contact: May cause mild irritation including stinging, tearing, pain, and redness. Chronic Exposure: Prolonged or repeated skin contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Passage of material into the body through the skin is possible is large volumes. Eye Contact: May cause mild irritation including stinging, tearing, pain, and redness. Chronic Exposure: Prolonged or repeated skin contact may cause dermatitis. Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders may be more susceptible to the effects of this substance. Target Organs: Respiratory system, eyes, skin. Section 3 - Composition / Information on Ingredients Ingredient CAS No. Percent Undecane 1120-21-4 <100 Section 4 - First Aid Measures Inhalation: Remove to fresh air. If not breathing, provide artificial respiration. If breathing difficulty		Section I - Chemical Product and Company Identification	
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skin with emollient. Obtain immediate medical attention if irritation, blisters, or redness develop.	amounts of wate		
Eye Contact: Immediately flush eyes with copious quantities of water for at least 15 minutes, holdin	amounts of wate skin with emollie	t. Obtain immediate medical attention if irritation, blisters, or redness develop.	
open eyelids to ensure adequate flushing. Seek immediate medical attention if persistent irritation oc	amounts of wate skin with emollie Eve Contact: In	t. Obtain immediate medical attention if irritation, blisters, or redness develop. rediately flush eyes with copious quantities of water for at least 15 minutes, holdi	ng
Section 5 - Fire-Fighting Measures	amounts of wate skin with emollie Eye Contact: In open eyelids to e	t. Obtain immediate medical attention if irritation, blisters, or redness develop. nediately flush eyes with copious quantities of water for at least 15 minutes, hold ure adequate flushing. Seek immediate medical attention if persistent irritation of	ng

Flash Point: 65 °C (149 °F) Auto Ignition Temperature: 204.6 °C (400.3 °F)

Explosion Limits in Air: 0.60-6.5 % (V)

Products of Combustion: CO, CO2

Flammable Liquid and Vapor!

Explosion: Slightly explosive in presence of heat. Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back.

Fire Extinguishing Media: Dry chemical, foam, or carbon dioxide.

Special Information: In the event of a fire, wear full protective clothing and approved self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode.

Section 6 - Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. If possible, remain uphill and upwind from spill. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal.

Section 7 - Handling and Storage

Do not breathe gas/fumes/ vapor/spray. Handle as a combustible liquid: keep away from heat, sparks, and open flame. Protect against physical damage. During transfer containers should be bonded and grounded to reduce the possibility of static-initiated fire or explosion. Possibility of static charge accumulation increases in cold temperature, low humidity conditions. Store in approved, vented containers in a cool, dry, well-ventilated location, away from any area where the fire hazard may be acute. Separate from incompatibles. Store and handle only in non-smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death. Keep containers closed when not in use.

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	S	ection 8 - Exposure	e Controls / Personal Protection		
Exposure Limits					
		TWA(ppm)	STEL(ppm)		
Heptane	ACGIH	Not Available	Not Available		
Ventilation	System: A sy	stem of local and/or	general exhaust is recommended to keep employee		
exposures	below the Air	borne Exposure Limits	. Local exhaust ventilation is generally preferred because		
it can conti	ol the emissi	ons of the contaminar	at at its source, preventing dispersion of it into the genera		

it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved): If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure

limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9 - Physical and Chemical Properties

Appearance: Clear, colorless liquid

Odor: Mild, hydrocarbon and gasoline-like.

Solubility: Partially soluble in methanol, diethyl ether.

Specific Gravity: 0.74 at 20 °C (68 °F)

Volatiles: Not Available Boiling Point: 196 °C (384.8 °F)

Melting Point: -10 °C (14 °F) Vapor Density (Air=1): 5.4

Vapor Pressure: 0.1 kPa at 20 °C (68 °F)

Evaporation Rate (n-butylacetate=1): >1

Section 10 - Stability and Reactivity

Stability: Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, and non-combusted hydrocarbons (smoke).

Hazardous Polymerization: Will not occur.

Incompatibilities: Oxidizing agents, reducing agents, acids, bases.

Corrosivity: Not considered to be corrosive for metals or glass.

Conditions of Instability: Heat, flames, ignition sources and incompatibles. Keep out of water supplies and sewers

Section 11- Toxicological Information

Toxicological Data

Acute Dermal LD50 (Rabbits): Not Available

Acute Oral LD50 (Rats): Not Available

Inhalation LC50 (Rats): >442 ppm/8 h

Chronic Effects on Humans: Prolonged or repeated skin contact may cause dermatitis.

Section 12 - Ecological Information

Environmental Fate: Keep out of sewers, drainage areas, and waterways. Report spills and releases, as applicable, under Federal and State regulations. When released into the soil, this material may biodegrade to a moderate extent, but is not expected to leach into groundwater and quickly evaporates. When released into water, this material may biodegrade to a moderate extent, but is expected to quickly evaporate. This material has an estimated bioconcentration factor (BCF) of greater than 100. This material has a log octanol-water partition coefficient of greater than 3.0. This material may bioaccumulate to some extent. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. This material is expected to have a half-life between 1 and 10 days when released into the air

Environmental Toxicity: No information found.

Section 13 - Disposal Considerations

Waste must be disposed of in accordance with federal, state and local environmental control regulations. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA 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. Dispose of container and unused contents in accordance with federal, state and local requirements. Section 14 - Transport Information Domestic (Land, D.O.T.), International (Water, I.M.O., Air, I.C.A.O.) Proper Shipping Name: UNDECANE Hazard Class: 3 UN/NA: UN2330 Packing Group: III Section 15 - Regulatory Information U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION Product and its constituents are present on the EPA TSCA Inventory. 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. New Jersey: Undecane TSCA 8(b) Inventory: Undecane TSCA 4(a) Proposed Test Rules: n-heptane TSCA 8(d) H and S data Reporting: Undecane **Other Regulations** OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances. **Other Classifications** WHMIS: CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLEAN WATER ACT (OIL SPILLS) Any spill or release of this product to "navigable waters" (surface water, including 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. SARA SECTION 311/312 - HAZARD CLASSES Fire hazard, acute health hazard Section 16 - Other Information Updated May 29, 2015 WHMIS: This SDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The above information has been developed based upon currently available scientific data. New information may be developed from time to time which may render the conclusions of this report

obsolete. Therefore, no warranty is extended as to the applicability of this information to the user's intended purpose or for the consequences of its use or misuse. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. Crosscutting Concepts, LLC shall not be held liable for any damage resulting from handling or from contact with the above product.