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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 Synonyms: n-heptane, dipropyl methane, gettysolve-C, heptyl hydride
Molecular Weight: 100.21 g/mole Chemical Formula: C_7H_{16} Chemtrec Phone: 800-424-9300
National Response Center: 800-424-8802
Product Use: Sample for Analysis
Product Use: Sample for Analysis

Section 2 - Hazard Identification

FLAMMABLE LIQUID Category 2
DANGER: Highly flammable liquid and vapor

NFPA Ratings: Health: **1** Flammability: **3** Reactivity: **1** Other: **Oxidizer**

Emergency Overview
WARNING! FLAMMABLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. AFFECTS THE CENTRAL NERVOUS SYSTEM.
Inhalation: Inhalation of vapors may cause irritation to respiratory system. May produce light headedness, dizziness, muscle incoordination, loss of appetite, and nausea. Inhalation of high vapor concentrations may cause Central Nervous System depression resulting in dizziness, narcosis, and unconsciousness.
Ingestion: Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting resulting in lung inflammation and other lung injury.
Skin Contact: 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 this 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: The substance may be toxic to lungs, peripheral nervous system, upper respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce damage to target organs.
Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or impaired pulmonary function may be more susceptible to the effects of this substance. Individuals with preexisting heart disorders maybe more
susceptible to arrhythmias if exposed to high concentrations of this material.
Target Organs: Overexposure to this material or its components has been suggested as a cause of mild, reversible kidney 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: Remove to fresh air. If not breathing, provide artificial respiration. If breathing difficulty is experienced, provide oxygen. Immediately seek medical attention if symptoms appear.
Ingestion: DO NOT INDUCE VOMITING. DO NOT GIVE LIQUIDS. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce risk of aspiration.

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, CO_2
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

Section 1 - Chemical Product and Company Identification

Name: Undecane
Common Synonyms: Hendecane
Molecular Weight: 156.31 g/mole
National Response Center: 800-424-8802
Product Use: Sample for Analysis
Product Use: Sample for Analysis

Section 2 - Hazard Identification

FLAMMABLE LIQUID Category 2
DANGER: Highly flammable liquid and vapor

NFPA Ratings: Health: **3** Flammability: **2** Reactivity: **0** Other: **Oxidizer**

Emergency Overview
WARNING! 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 inhaled.
Ingestion: Swallowing large amounts may be harmful and presents an aspiration hazard. This material can get into the lungs during swallowing or vomiting resulting in lung inflammation and other lung injury. May cause irritation to the digestive tract.
Skin Contact: 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 this 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 is experienced, provide oxygen. Immediately seek medical attention if symptoms appear.
Ingestion: DO NOT INDUCE VOMITING. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce risk of aspiration. If conscious and alert, rinse mouth and drink 2-4 cups of milk or water.
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: 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, CO_2
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.

Section 8 - Exposure Controls / Personal Protection

Exposure Limits

		TWA(ppm)	STEL(ppm)
Heptane	ACGIH	Not Available	Not Available

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

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.