**** MATERIAL SAFETY DATA SHEET ****

Petroleum ether (EMD)
12787

**** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ****

MSDS Name: Petroleum ether (EMD)
Catalog Numbers: E1390 1, E1395 1, E1390 20, E1390 200, E1394 1, E1394 2000, E1394 600, E1391, E13920, E139300, E1394, E1394 500, E1395 4, E13954, E139540, P480 4, P4804, S76880 2, S768802

Synonyms:
Ligroine
Company Identification: Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07401

For information, call: 201-798-7100
For emergency information, call: 201-798-7100
For CHEMTREC assistance, call: 800-424-9300

**** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ****

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Chemical Name: **Ligroine**
CAS: 8032-32-4

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**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW
Appearance: Clear liquid, Flash Point: 0 F.
DANGER: EXTREMELY FLAMMABLE LIQUID. PROLONGED OR REPEATED CONTACT MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. USE WITH CAUTION. DRUNKEN SKIN AND CAUSE IRITATION. CAUSES IRRITATION. CONSUME CAUSING CENTRAL NERVOUS SYSTEM DEPRESSION. MAY CAUSE LUNG DAMAGE. CAUSES IRRITATION. CAUSES IRRITATION. CAUSES IRRITATION.
Target Organs: Central nervous system.
Potential Health Effects
Eyes: Causes irritation. Contact with the eyes may cause irritation and/or dermatitis. Exposure may cause eye irritation characterized by redness, irritation, and inflammation.
Skin: Prolonged and/or repeated contact with the skin may cause irritation and/or dermatitis. Exposure may cause eye irritation characterized by redness, irritation, and inflammation.
Ingestion: Aspiration hazard. Causes gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause central nervous system depression, characterized by excitability, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma, and possible death due to respiratory failure.
Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness, and coma. High vapor concentrations may cause dizziness.
Chronic: Prolonged or repeated skin contact may cause dermatitis.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid.
Skin: Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.
Ingestion: Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand. MSHA/NIOSH (approved or equivalent), and full protective gear. Extremely flammable liquid. Vapor may cause flash burns.
Extinguishing Media: Use foam, dry chemical, or carbon dioxide. Water may be ineffective. This material is lighter than water and insoluble in water. The fire could easily be spread by the use of water in an area where the water cannot be contained.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material. (e.g., dry sand or earth), then place into a chemical waste container. Remove all sources of ignition. Use a spark-proof tool.

**** SECTION 7 - HANDLING AND STORAGE ****

Handling: Use with adequate ventilation. Ground and bond containers when transferring materials. Avoid contact with eyes, skin, and clothing. Empty containers retain product residues (liquid and/or vapor), and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, sparks or open flames. Avoid contact with heat, sparks, and flame. Avoid ingestion and inhalation. Prevent buildup of vapors to explosive concentrations.

Storage:
- Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Store in cool, dry, well-ventilated area away from incompatible substances.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:
Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Physical Limits:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA</th>
<th>Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ligroine</td>
<td>300 ppm</td>
<td>1370</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs:
- Ligroine:
  - 300 ppm TWA; 1350 mg/m³ TWA; 400 ppm STEL; 1800 mg/m³ STEL

Personal Protective Equipment:
- Eyes: Wear appropriate protective eyewear as chemical safety goggles as described by OSHA’s eye and face protection requirements in 29 CFR 1910.133.
- Skin: Wear appropriate protective clothing to prevent skin exposure.
- Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State: Liquid
Appearance: Clear liquid
Odor: Mild gasoline-like odor
PH: Not available
Vapor Pressure: Not available
Vapor Density: Not available
Evaporation Rate: Not available
Viscosity: Not available
Boiling Point: 35 C
Freezing/Melting Point: Not available
Decomposition Temperature: Not available
Solubility: Negligible in water
Specific Gravity/Density: Not available
Molecular Formula: Not applicable
Molecular Weight: 87

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid:
- Incompatible materials, ignition sources, excess heat.

Incompatibilities with Other Materials:
- Oxygen and strong oxidizing agents

Hazardous Decomposition Products:
- Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Has not been reported.

*** SECTION 11 - TOXICOLOGICAL INFORMATION ***

RTCEC#:
- CASE 8032-32-4: CN1860000
- LD50/LC50:
- LD50 - 3015 mg/kg; LC50 - 0.464 ppm/4h; Oral, mouse: LC50 - 415 mg/kg.
- Carcinogenicity:
  - Lignite: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology:
- No data available.

Teratogenicity:
- No data available.

Reproductive Effects:
- No data available.

Neurotoxicity:
- No data available.

Mutagenicity:
- No data available.

Other Studies:
- No data available.

*** SECTION 12 - ECOLOGICAL INFORMATION ***

Ecotoxicity:
- Not available.

Environmental Fate:
- Physical/Chemical: No information found.
- Other: No information found.

*** SECTION 13 - DISPOSAL CONSIDERATIONS ***

Disposal of in a manner consistent with federal, state, and local regulations.

RCRA D-Series Maximum Concentration of Contaminants: Not listed.

RCRA D-Series Chronic Toxicity Reference Levels: Not listed.

RCRA F-Series: Not listed.

RCRA P-Series: Not listed.

RCRA U-Series: Not listed.

Not listed as a material banned from land disposal according to RCRA.

*** SECTION 14 - TRANSPORT INFORMATION ***

US DOT
- Hazard Class: 3
- UN Number: UN1271

IMO
- No information available.

IATA
- No information available.

RID/ADR
- No information available.

Canadian TOC
- No information available.

Shipping Name: PETROLEUM SPIRIT
- Hazard Class: 3
- UN Number: UN1271

Other information: FLASHPOINT - 40C

*** SECTION 15 - REGULATORY INFORMATION ***

A. Federal

TSCA
- CASE 8032-32-4 is listed on the TSCA inventory.
- Health & Safety Reporting List
  None of the chemicals are on the Health & Safety Reporting List.
- Chemical Test Rules
  None of the chemicals in this product are under a Chemical Test Rule.
  Section 12a
  None of the chemicals are listed under TSCA Section 12b.
- TSCA Significant New Use Rule
  None of the chemicals in this material have a SNUR under TSCA.
- CERCLA/SARA
  Section 302 (RO)

B. State

Lignite can be found on the following state right to know lists: New Jersey, Pennsylvania.

California: No Significant Risk Level:
- None of the chemicals in this product are listed.

C. International

Canada
- CASE 8032-32-4 is listed on Canada's DSL/NDSL List.
- CASE 8032-32-4 is listed on Canada's Ingredient Disclosure List.

European Labeling in Accordance with EC Directives
- Hazard Symbols: Not available.
- Risk Phrases: Safety Phrases:
- Exposure Limits:
  - OEL-AUSTRALIA: TWA 0.1 mg/m³
  - OEL-BELGIUM: TWA 0.1 mg/m³
  - OEL-DENMARK: TWA 0.1 mg/m³
  - OEL-GERMANY: TWA 0.1 mg/m³
  - OEL-NETHERLANDS: TWA 0.1 mg/m³
  - OEL-ITALY: TWA 0.1 mg/m³
  - OEL-LUXEMBOURG: TWA 0.1 mg/m³
  - OEL-SWITZERLAND: TWA 0.1 mg/m³
  - OEL-TURKEY: TWA 0.1 mg/m³
  - OEL-UNITED KINGDOM: TWA 0.1 mg/m³
  - OEL-UK: BULGARIA, COLOMBIA, KOREA, check ACGIH TLV.
  - OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGIH TLV.

*** SECTION 16 - ADDITIONAL INFORMATION ***

Additional Information:
- Added NFPA codes to Section 5.
- Added SARA classifications to Section 3.
- Section 3, Emer Overview, added "DANGEROUS FLAMMABLE LIQUID."
- Section 3, Emer Overview, added "PROLONGED OR REPEATED CONTACT MAY CAUSE CHEMICAL BURNING.
- Section 3, Emer Overview, added "CAUSES EYE AND SKIN IRRITATION."
- Section 3, Emer Overview, added "CAUSES DIGESTIVE AND RESPIRATORY TR. IRRITATION."
- Section 3, Emer Overview, added "MAY CAUSE LUNG DAMAGE."
- Section 3, Emer Overview, added "MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION."
- Section 3, Eye Effects, added "Causes eye irritation."
- Section 3, Skin Effects, added "Exposure may cause irritation of skin and eyes."
- Section 3, Skin Effects, added "Prolonged and/or repeated contact m."
- Section 3, Inhalation Effects, added "Inhalation of high concentrations may cause:
  - Prolonged exposure may cause:
  - shortness of breath, confusion, dizziness"
- Section 3, Inhalation Effects, added "High vapor concentrations may cause:
  - high concentrations may cause:
  - shortness of breath, confusion, dizziness"
- Section 3, Inhalation Effects, added "Causes gastrointestinal irritation.
- Section 3, Inhalation Effects, added "May cause central nervous system depression."
- Section 3, Chronic Effects, added "Prolonged or repeated skin contact."
- Section 4, Eye First Aid, added "Immediately flush eyes with plenty...
- Section 4, Skin First Aid, added "Remove from exposure to fresh air."
- Section 4, Inhalation First Aid, added "Get medical aid immediately...
- Section 4, Inhalation First Aid, added "If not breathing, give artificial respirations...
- Section 4, Inhalation First Aid, added "If breathing is difficult,
give any...
Section 4. Ingestion First Aid, added "Do NOT induce vomiting..."
Section 4. Ingestion First Aid, added "Get medical aid immediately..."
Section 4. Ingestion First Aid, added "Never give anything by mouth to an..."
Section 5. Extinguishing Media, added "Water may be ineffective..."
Section 5. Extinguishing Media, added "Use foam, dry chemical, or ca
Section 5. Extinguishing Media, added "This material is lighter than water..."
Section 5. General Firefighting, added "Extremely flammable liquid...
Section 5. General Firefighting, added "As in any fire, wear a self-con
Section 5. General Firefighting, added "Vapor may cause flash fire...
Section 6. Spills/Leaks, added "Absorb spill with inert material..."
Section 6. Spills/Leaks, added "Remove all sources of ignition..."
Section 6. Spills/Leaks, added "Use a spark-proof tool..."
Section 6. Handling, added "Use with adequate ventilation..."
Section 6. Handling, added "Avoid contact with eyes, skin and..."
Section 6. Handling, added "Avoid contact with heat, sparks and..."
Section 6. Handling, added "Avoid ingestion and inhalation..."
Section 6. Handling, added "Prevent build up of vapors to explo..."
Section 6. Handling, added "Ground and bond containers when tran...
Section 6. Handling, added "Empty containers retain product res..."
Section 7. Storage, added "Store in a cool, dry, well-ventilated..."
Section 7. Storage, added "Keep away from heat, sparks, and fi..."
Section 7. Storage, added "Keep away from sources of ignition..."
Section 7. Storage, added "Store in a tightly closed container..."
Section 8. Eye Protection, added "Wear appropriate protective eyegl...
Section 8. Skin Protection, added "Wear appropriate gloves to preven..."
Section 8. Clothing, added "Wear appropriate protective clothi...
Section 8. Respirators, added "Follow the OSHA respirator regulat..."
Section 9. Physical Properties has changed.
Section 10. Stability, added "Stable at room temperature in close..."
Section 10. Condensation, added "Incompatible materials..."
Section 10. Condensation, added "Ignition sources..."
Section 10. Condensation, added "Excess heat..."
Section 10. Decomposition Prod., added "carbon monoxide..."
Section 10. Decomposition Prod., added "carbon dioxide..."
Section 10. Incompatibilities has changed.
Section 11. Environmental has changed.
Section 11. Neurotoxicity has changed.
Section 11. Teratogenicity has changed.
Section 11. Mutagenicity has changed.
Section 11. Reproductive has changed.
Section 11. Other Info has changed.
Section 12. Ecology Info has changed.
MSDS Creation Date: 12/27/1994 Revision Date: 3/04/1996
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