**DATA SHEET Nr 2040 L**

**ETHYL CHLOROFORMATE**

**ECF**

\[
\text{CH}_3 - \text{CH}_2 - \text{O} - \text{C} - \text{Cl}
\]

<table>
<thead>
<tr>
<th>Molecular formula:</th>
<th>C\textsubscript{3}H\textsubscript{5}ClO\textsubscript{2}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular weight:</td>
<td>108.5</td>
</tr>
<tr>
<td>CAS number:</td>
<td>541-41-3</td>
</tr>
<tr>
<td>EC number:</td>
<td>208-778-5</td>
</tr>
</tbody>
</table>

**SYNONYM**
Carbonochloridic acid, ethyl ester.

**APPEARANCE**
Clear liquid with pungent odor.

**PHYSICAL PROPERTIES**

- **Density (20°C):** 1.14 g/cm\(^3\)
- **Boiling point:** 95 °C/101 kPa
- **Solubility:** Soluble in usual organic solvents (acetone, toluene, chloroform, THF).

**CHEMICAL PROPERTIES**

- Reacts by hydrolysis yielding hydrochloric acid, carbon dioxide and ethanol.
- Reacts with alcohols yielding carbonates.
- Reacts with amines yielding carbamates.

**USES**
- Organic synthesis intermediate.
ETHYL CHLOROFORMATE
ECF

SPECIFICATION

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Guaranteed value</th>
<th>Method</th>
<th>Operating procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
<td>Visual</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>( \leq 30 ) APHA</td>
<td>Colorimetry</td>
<td>C – 210</td>
</tr>
<tr>
<td>Purity</td>
<td>( \geq 99.0 % )</td>
<td>Gas chromatography</td>
<td>GC – 240</td>
</tr>
<tr>
<td>Phosgene</td>
<td>( \leq 0.1 % )</td>
<td>Iodometry</td>
<td>I – 230</td>
</tr>
<tr>
<td>Hydrogen chloride</td>
<td>( \leq 0.1 % )</td>
<td>Acidimetry</td>
<td>A – 220</td>
</tr>
<tr>
<td>Ethanol</td>
<td>( \leq 0.1 % )</td>
<td>Gas chromatography</td>
<td>GC – 240</td>
</tr>
<tr>
<td>Diethyl carbonate</td>
<td>( \leq 0.5 % )</td>
<td>Gas chromatography</td>
<td>GC – 240</td>
</tr>
<tr>
<td>Methyl chloroformate</td>
<td>( \leq 0.05 % )</td>
<td>Gas chromatography</td>
<td>GC – 240</td>
</tr>
</tbody>
</table>

PACKAGING
Polyethylene lined metal drum containing 200 kg.
In bulk.

HANDLING PRECAUTIONS

- **Physicochemical hazard:**
  Flash point (closed cup): 16 °C

- **Health hazards:**
  LD 50 (oral, rat): 205 mg/kg
  Irritating on skin, mucous membrane and eyes.
  Corrosive.

- **Recommended:**
  Avoid contact with metallic compounds which catalyze its decomposition.
  Wear gloves, goggles, mask and protective clothes.
  If eyes are contaminated wash immediately with clean water for at least 15 minutes. If concentrated vapors are inhaled carry person into fresh air. In both cases consult a physician.

- **Neutralization:**
  Neutralize by reaction with an alkaline solution.

STORAGE
Stored in its closed original drum, protected from direct sunshine, in a covered, dry, cool and well-ventilated warehouse the product is stable.
However, in case of prolonged storage it is recommended to check again the product before use by measuring typical parameters of its quality such as color, hydrogen chloride and ethanol levels.

TRANSPORTATION
Refer to MSDS.

Nr 2040 L August 2018