Chlorofluorocarbons (CFCs or Freon compounds)

The Freon/CFC Experts
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Remediation Feasibility Studies
Soil and Groundwater Remediation
Natural Resource Damage Assessment
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### Properties of Common Chlorofluorocarbons

<table>
<thead>
<tr>
<th>Chlorofluorocarbon</th>
<th>Compound Name</th>
<th>Boiling Point (°C)</th>
<th>Density (g/cm³ at 25°C)</th>
<th>Molecular Weight (g/mol)</th>
<th>Solubility (mg/L at 25°C)</th>
<th>Henry’s Law Constant</th>
<th>Octanol-Water Partition Coef. (log K&lt;sub&gt;ow&lt;/sub&gt;)</th>
<th>Ref</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFC-11 Freon-11</td>
<td>Trichlorofluoromethane</td>
<td>23.8</td>
<td>1.49</td>
<td>137.37</td>
<td>1,100</td>
<td>4.03</td>
<td>2.13</td>
<td>1</td>
</tr>
<tr>
<td>CFC-12 Freon-12</td>
<td>Dichlorodifluoromethane</td>
<td>-29.8</td>
<td>1.31</td>
<td>120.91</td>
<td>280</td>
<td>16.67</td>
<td>1.82</td>
<td>1</td>
</tr>
<tr>
<td>CFC-113 Freon-113</td>
<td>1,1,2-Trichloro-1,2,2-trifluoroethane</td>
<td>47.7</td>
<td>1.56</td>
<td>187.38</td>
<td>200</td>
<td>22.03</td>
<td>3.09</td>
<td>2</td>
</tr>
</tbody>
</table>

### California Water Quality Criteria and Guidelines

<table>
<thead>
<tr>
<th>Chlorofluorocarbon</th>
<th>Regulatory Limit (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Notification Level</td>
</tr>
<tr>
<td>CFC-11</td>
<td>---</td>
</tr>
<tr>
<td>CFC-12</td>
<td>1,000</td>
</tr>
<tr>
<td>CFC-113</td>
<td>---</td>
</tr>
</tbody>
</table>

### California Drinking Water Sources and Systems Impacted by Chlorofluorocarbons

<table>
<thead>
<tr>
<th>Compound</th>
<th>Number of Systems</th>
<th>Number of Sources</th>
<th>Maximum Detected Concentration (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freon-11</td>
<td>24</td>
<td>48</td>
<td>244</td>
</tr>
<tr>
<td>Freon-12</td>
<td>52</td>
<td>216</td>
<td>101</td>
</tr>
<tr>
<td>Freon-113</td>
<td>20</td>
<td>30</td>
<td>91</td>
</tr>
</tbody>
</table>

### Typical Uses of Chlorofluorocarbons

- **Freon-11 (CFC-11)**
  - Synonym: Trichlorofluoromethane
  - Use: Aerosol spray cans, Solvent, Foam blowing agent

- **Freon-12 (CFC-12)**
  - Synonym: Dichlorodifluoromethane
  - Use: Refrigerators, Air conditioners, Foam blowing agent

- **Freon-113 (CFC-113)**
  - Synonym: Trichlorotrifluoroethane
  - Use: Cleaning solvent for manufacturing processes and electronic components

### Anaerobic Biotransformation Pathway of Freon-11

![Anaerobic Biotransformation Pathway](image)

**Sources:**
5. California Department of Public Health as of November 2011.