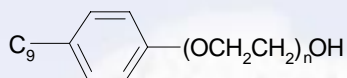


Biomarker Focus

Alkylphenol ethoxylates

Alkylphenol ethoxylates, in particular **nonylphenol** and **octylphenol ethoxylates**, are widely used as **environmental surfactants**.



General **structural formula** of 4-nonylphenol ethoxylates

Toxic Hazards

Alkylphenol ethoxylates are suspected **endocrine disruptors**.

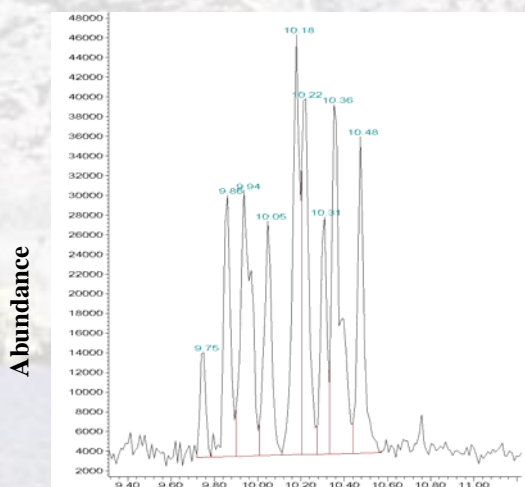
Nonylphenol ethoxylates are banned in many countries and are on the second **Priority Substances List (PSL2)** of the **Canadian Environmental Protection Act**.

Methods of Analysis

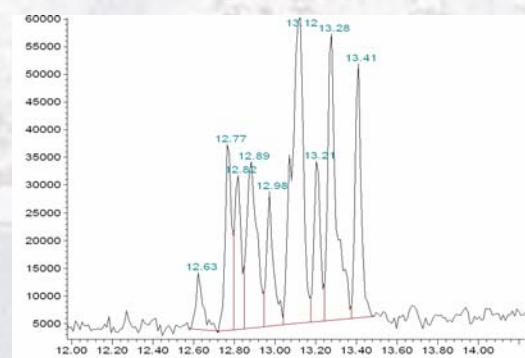
Low molecular weight alkylphenol ethoxylates are analysed by **GC-MS**, and **high molecular weight** alkylphenol ethoxylates can be analysed by **HPLC** techniques.

Chiron offers

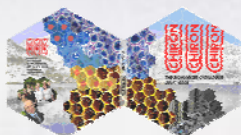
- CHIRON offers a unique and broad range of **single isomer of octyl- and nonylphenol ethoxylates as solution standards**. They can be used as calibration standards for GC-MS analysis of waste water and waste water sludges. In addition Chiron offers **neat material in mg and g scale** for exposure and toxicological studies.
- **Multicomponent mixtures** of alkylphenol ethoxylates
- **Custom synthesis and custom manufactured solutions available on request**



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GC-MS chromatograms of nonylphenol mono- and diethoxylates, provided by RA-2, The Central Sewage Plant (Strømmen, Oslo, Norway)

Phenols and phenol analysis

- **Alkylphenols:** used as **surfactants, oil additives, antioxidants, herbicides, insecticides, vitamin intermediates** etc.
- **Chlorophenols:** formed by the **use of chlorine** in water treatment plants
- **Alkylnitrophenols:** used as **herbicides and pesticides**

Toxic and environmental hazards

Phenols are:

- **Toxic** – suspected endocrine disruptors
- **Easily absorbed** into the body
- **Mobile** in soils and aquatic media
- **Resistant** to biodegradation

Methods of analysis

Direct analysis by **GC-FID, GC-ECD, GC-MS** etc.

Derivatization prior to GC- analysis by

- **Pentafluorobenzoyl chloride** (PFB-esters)
- **Diazomethane acetic anhydride** (Methyl ethers)
- **Acetic anhydride** (Acetates)

Chiron offers

- **Standardised solutions** according to ISO and EPA methods
 - Pure **single** alkyl-, chloro-, bromo-, nitrophenols
 - **Internal surrogate standards** - ISO/EPA recommended
 - **Derivatizing** agents and methods
- *Custom synthesis and custom manufactured solutions available on request*
-

PLEASE FORWARD THE NEW 2005 Phenol Standards Catalogue

– containing more than 30 mixtures, 120 single component phenols, 60 internal standards, and the description of the most recent ISO and EPA methods.

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