



HIGH QUALITY STANDARDS FOR **FOOD SAFETY**

Food Toxins

Food processing contaminants

Food packaging contaminants

Environmental contaminants

Vitamins

Food ingredients: Colours, Aroma, Fatty Acids



3-Monochloropropanediol 3-MCPD esters

In recent years, there has been increasing interest in 3-MCPD fatty acid esters in food analysis. These esters are formed during the production and heating of oils and fats. They are considered harmful at high levels of consumption.

3-MCPD is a known carcinogen found as a heat-induced contaminant in many different types of fat-containing foodstuffs. The European Food Safety Authority (EFSA) has defined a limit of $2\mu\text{g}/\text{kg}$ body weight as a tolerable daily intake (TDI).

However, in most foodstuffs only a small percentage of 3-MCPD is present as free 3-MCPD; most of it is ester-linked with fatty acids. The 3-MCPD fatty acid esters are assumed to be completely metabolized to free 3-MCPD by a lipase-catalyzed hydrolysis. They are found to be present in all refined fats and oils, with the highest levels found in palm oil.

3-MCPD esters are a complex mixture of mono- and diesters, linked with different fatty acids. The two different monoesters are often difficult to separate by GC or HPLC.



Glycidyl fatty acid esters

Glycidyl fatty acid esters are commonly found in the same foodstuffs as 3-MCPD esters (See our BMF 49). This is a challenge because the method of choice for analysis of 3-MCPD esters is derivatization with phenylboronic acid in NaCl solution. Under these conditions, glycidyl fatty esters are partly degraded to 3-MCPD by opening the epoxide and hydrolysis of the ester. Glycidol derivatives are therefore also wrongly detected as 3-MCPD using this method.

In the human body glycidyl esters are metabolized into free glycidol, a compound that is classified as potentially carcinogenic (group 2 carcinogens) by the IARC (International Agency for Research on Cancer).

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European standard CEN/TC 347/WG 4N 19 24 Suspected allergens in analytical purity

Safe and accurate analysis of priority suspected allergens has been hampered by the lack of pure and reliable standards. Many of the known allergens have only been available as mixtures of isomers or impure compounds and the purities stated by various fine chemical suppliers have proven to be unreliable for most of these substances.

Chiron has purified each individual allergen in order to obtain a reliable standard for the 24 suspected compounds as suggested in the new CEN/TC347/WG 4N 19 method, with 26 isomers in total.

Nitrosamines and Nitramines

Chiron has built up a strong track record of supplying new reference standards since 1983. We are therefore proud to offer various nitrosamine and nitramine reference standards.

Our mission is to market highly purified calibrates in either crystalline form or as standardized solutions for chemical analysis, including internal standards. The benefits of using our standards include:

- **Fast turnover time due to excellent service.**
- **Guaranteed high and consistent quality.**
- **Bulk quantities available on request.**
- **Custom solutions and custom synthesis on request.**
- **Continuous development of innovative products.**

It is well known that nitrosamines and nitramines can be dangerous to humans, animals and plants. There are several technologies which release them into the environment.

Nitrosamines are a class of chemical compounds that have received much attention since 1956, when two British scientists, John Barnes and Peter Magee, reported that dimethylnitrosamine was produced in liver tumors in rats. Nitrosamines are formed by reactions of nitrites and secondary amines (e.g. in proteins) under acidic conditions like gastric milieu. Human beings ingest nitrites from food, esp. fried or grilled meat and vegetables. Disposal of tobacco products also causes a high intake of nitrosamines (mainly N-Nitrosornicotin).

CO₂ capture is a rapidly developing technique. Solvents used for CO₂ capture are often a mixture of several amines, with the detailed compositions not always known in detail.

It is known that the amine blends for CO₂ capture are recycled, however a certain amount of the amines are either degraded or emitted to the air. The released amines are often unstable in air, and degrade to toxic substances such as nitrosamines and nitramines.

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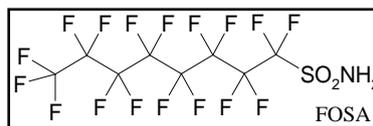
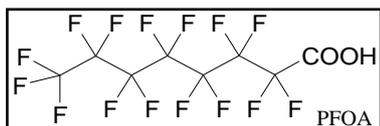
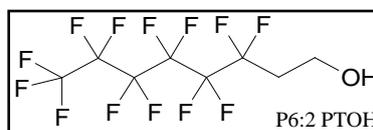
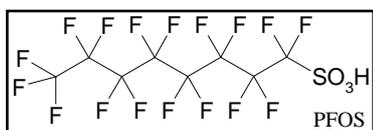


Perfluorinated organic compounds

Perfluorinated Organic Compounds (PFCs) are used in numerous commercial products such as fire protection agents, textile protection agents, floor polishers, detergents, paints, paper treatment agents and electronic equipment.

The first PFCs (PFCs = Perfluorinated alkanolic acids, alcohols and sulfonic acids) were based on Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA). Due to environmental reports, warning about the bioaccumulation of these compounds, new and more readily biodegradable substances have been introduced. Typically, these are various telomeric acids, alcohols and sulfonamides.

The biodegradation-route of the commercial telomers is currently under investigation and new metabolites are likely to be found. Chiron now offers a large range of PFCs, telomeric acids, alcohols and possible metabolites.



PAPS

Telomeric 6:2, 8:2 and 10:2 mono-, di- and tri-polyfluoroalkyl phosphate esters

It is recommended that the EU member states (recommendation 2010/161/EU, 17 March 2010) carry out the analysis of perfluoro-alkylated substances including PERFLUOROPHOSPHATE SURFACTANTS such as 8:2 mono-PAPS and 8:2 di-PAPS in order to monitor their presence in food.

Please inquire for more information regarding our products

