

BMF 56: Glycidyl fatty acid esters



Over the last years, there has been an increase in interest for 3-MCPD fatty acid esters and glycidyl fatty acid esters in food analysis. These esters are formed during production and heating of oils and fats, and are thought to be harmful at a high level of consumption.

3-MCPD (3-monochloropropane-1,2-diol) is a known carcinogen found as a heat-induced contaminant in many different types of foods. Recently, attention has been given to another group of heat-induced contaminants, 3-MCPD fatty acid esters (bound 3-MCPD) - see our BMF 49.

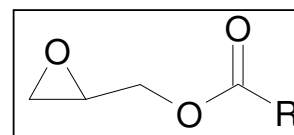
Glycidyl fatty acid esters are also found in foodstuffs in question. This is a challenge because the method of choice for analysis of 3-MCPD esters is derivatization with phenylboronic acid in NaCl solution. Hereby glycidyl fatty esters are partly degraded to 3-MCPD by opening the epoxide and hydrolysis of the ester. Glycidol derivatives are therefore also detected as 3-MCPD using this method.

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

Chiron AS now offers highly purified glycidyl fatty acid esters for use as reference standards in food analysis, as well as an internal standard and free glycidol!

Available from Chiron AS:

Glycidyl fatty acid esters		
9674.19-10MG	Glycidyl palmitate	glycidyl C16:0
9896.19-10MG	Glycidyl palmitoleate	glycidyl C16:1 (9- <i>cis</i>)
9899.21-10MG	Glycidyl stearate	glycidyl C18:0
9671.21-10MG	Glycidyl oleate	glycidyl C18:1 (9- <i>cis</i>)
9673.21-10MG	Glycidyl linoleate	glycidyl C18:2 (9- <i>cis</i> , 12- <i>cis</i>)
9672.21-10MG	Glycidyl linolenate	glycidyl C18:3 (6- <i>cis</i> , 9- <i>cis</i> , 12- <i>cis</i>)
9897.23-10MG	Glycidyl arachidate	glycidyl C20:0
9900.23-10MG	Glycidyl gadolenate	glycidyl C20:1 (11- <i>cis</i>)
9898.25-10MG	Glycidyl behenate	glycidyl C22:0
9714.3-10MG	Glycidol	
Internal Standards of Glycidyl fatty acid esters		
9924.19-10MG	Glycidyl palmitate-d31	glycidyl C16:0-d31



Structure of glycidyl fatty acid esters

Chiron AS also offers a wide range of mono- and di-esters of 3-MCPD, including deuterated standards, see **BMF 49**. Please inquire for more information or to receive an offer!

Literature:

Eur. J. Lipid Sci. Technol. 2011, 113, 277-278.

Eur. J. Lipid Sci. Technol. 2011, 113, 304-308.

<http://monographs.iarc.fr/ENG/Classification/index.php>.

R. Weisshaar, "3-MCPD-esters in edible fats and fat containing products"; 6th Int. Fresenius Conf. "Contaminants a. Residues in Food"; 2008.