NQAC
Nestlé Quality Assurance Center
Dublin

Technical Datasheet

Analysis Name: Ethylene Oxide (Total) by GC-MS/MS

Method Number: LI-00.058

Scope of Application: High and low water content samples, thickeners, flavoring, and colorings.

Type	Water content	Example
High water content samples	> 20 %	Ice cream, sauce, and fresh vegetables
Low water content samples	< 20 %	Spices, dried herbs, dried vegetables, cereals, inorganic salts, and food supplements
Thickeners	-	Guar gum, locust gum, and pectin
Flavoring and coloring samples	-	-

Description: Due to its high volatility (boiling point ca. 10 °C), Ethylene oxide (EtO) is converted to 2-chloroethanol (2-CE) by an acidic heat treatment. Then, 2-CE is extracted via a QuEChERS-based procedure and the resulting acetonitrile supernatant is cleaned by dispersive Solid Phase Extraction (d-SPE). After centrifugation, the extract is analyzed via GC-MS/MS. Quantification is performed by isotope dilution, using d4-chloroethanol (d4-2-CE) as internal standard (ISTD). The result is expressed as ETO equivalent (in mg of ETO per kg of sample) as the sum of free ETO and 2-CE available in the sample.

Sample Weight Required: 100 g

Analytical Platform: GC-MS/MS

Special Information: Due to the high volatility of ethylene oxide, we request that 2 original containers are submitted for EtO testing. If 2 containers are not submitted, additional sample might be needed to complete necessary retest, or we will need to proceed as compromised.

All flavoring and coloring samples will be prepared with a spike to demonstrate method applicability. If the spike recovery does not meet data acceptance criteria, the sample will be sent externally for testing.

Strongly recommended that samples are submitted frozen.

Matrix	Analyte Reported	Alias	Unit of Measure	Limit of Quantification	Reproducibility
High-water content	Ethylene Oxide (total)	ETO	mg/kg	0.01mg/kg	25%
Low water content	Ethylene Oxide (total)	ETO	mg/kg	0.01mg/kg	25%
Thickeners	Ethylene Oxide (total)	ETO	mg/kg	0.01mg/kg	25%
Coloring and Flavoring Samples*	Ethylene Oxide (total)	ETO	mg/kg	0.01mg/kg	65%

*All flavoring and coloring samples will be prepared with a spike to demonstrate method applicability. If the spike recovery does not meet data acceptance criteria, the sample will be sent externally for testing.