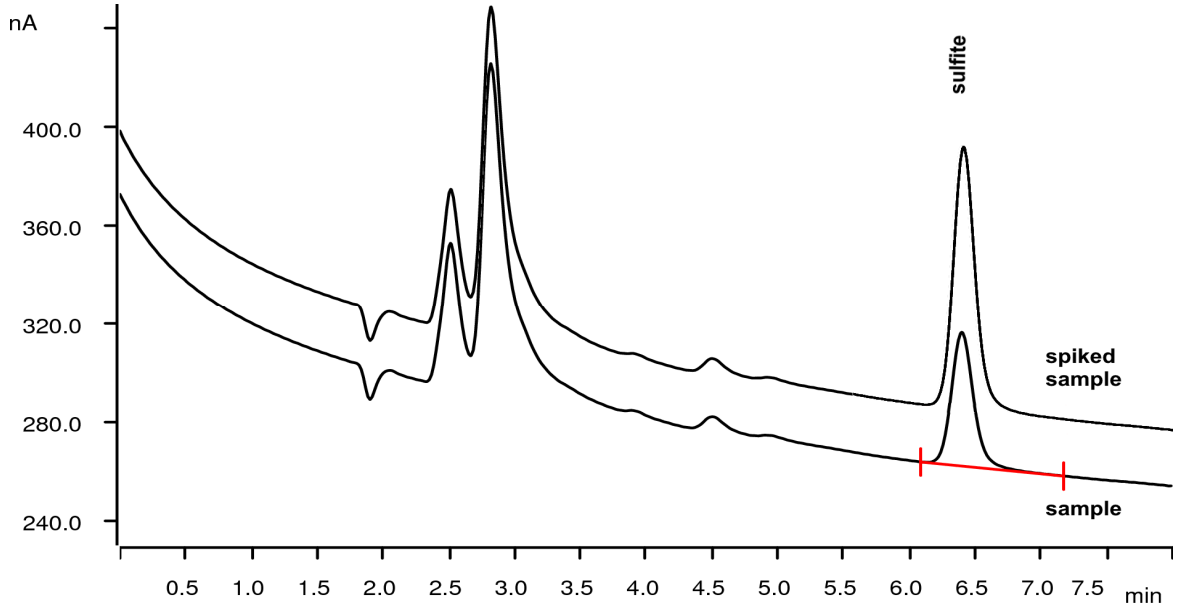
IC Application Note P–082

Sulfite determination in food and beverages applying amperometric detection

Determination of sulfite in complex matrices applying DC mode amperometric detection with a dedicated automatic CV activation of the electrode prior to the measurement.



Chromatogram overlay of canned garlic: unspiked and spiked.

Sulfite is found in many drinks, dried fruit, snacks etc. It acts as a preservative and may be added artificially or can be a side product of fermentation. As sulfite can induce a health risk, it is banned in raw foods and must be labeled on processed foods. Analysis of sulfite by IC with DC amperometric detection is nearly impossible due to the food matrix which fouls and deactivates the electrode surface very fast. The new automatic CV activation procedure (CV treatment, patent pending) cleans the electrode surface and recovers its sensitivity. This report shows DC amperometric detection of sulfite in several foodstuffs applying this activation step prior to the sulfite detection.

Results

Sample	Sulfite [mg/kg]	Spiked [mg/kg]	Recovery [%]
Red wine	86	110	103.8
Mustard	98	196	99
Canned garlic	2.6	42.7	100.4

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Sample

Red wine, mustard, canned garlic

Sample preparation

Weigh 1 g of sample, add diluent to a total weight of 30 g. Homogenize with e.g. an Ultra-Turrax homogenizer and centrifuge at 4000 rpm. Finally the sample is filtered through a 0.2 µm filter.

Columns

Metrosep Carb 2 - 150/4.0	6.1090.420
Metrosep Carb 2 Guard/4.0	6.1090.500

Solutions

Anion eluent	300 mmol/L sodium hydroxide 300 mmol/L sodium acetate
Diluent (for sulfite stabilization)	0.2 mmol/L sodium hydroxide 0.1 mmol/L formaldehyde

Instrumentation

930 Compact IC Flex Oven/Deg	2.930.2160
IC Amperometric Detector	2.850.9110
889 IC Sample Center – cool	2.889.0020
IC equipment Wall-Jet cell: without electrodes	6.5337.000
Ag/AgCl reference electrode for 6.1257.xxx	6.1257.720
Au working electrode, 3 mm	6.1257.210
MagIC Net 3.3 (minimum requirement)	6.6080.100

Analysis

DC amperometric detection with CV treatment

Parameters

Flow rate	0.5 mL/min
Injection volume (partial loop)	3 µL
P_{max}	20 MPa
Detector temperature	33 °C
Column temperature	35 °C
Sample temperature	6 °C
Recording time	8 min
Detection mode	DC / CV treatment
Range	2 mA
Channel	current

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