EN

ACETALDEHYDE

REF 984347

❶	3 x 20 ml Buffer A (Ready to use)
❷	3 x vial Lyo A (Lyophilisate)
❸	1 x 5 ml Buffer B (Ready to use)
❹	3 x vial Lyo B (Lyophilisate)
❺	Empty 10 ml vial

INTENDED USE
Reagent for photometric determination of total Acetaldehyde in homogenous liquid samples using automated Thermo Scientific™ Arena™ or Gallery™ analyzer.

Reagent kit can also be used for manual pipetting procedure.

METHOD
Enzymatic test with aldehyde dehydrogenase (AIDH).
Method is performed at 37 °C, using 340 nm filter.

PRINCIPLE OF THE PROCEDURE
Acetaldehyde is converted to acetic acid by AIDH (aldehyde dehydrogenase) in precense of NAD.

REAGENT INFORMATION	**Barcode ID**
20 ml BUF A + Lyo A = Reagent R1	774
1.6 ml BUF B + Lyo B = Reagent R2	A59

Note: Labels of reagent vials have two barcodes.
For Arena analyzers, turn the short barcode to the barcode reader.
For Gallery analyzers, turn the long barcode to the barcode reader.

Concentrations

Good buffer	> 10 mmol/L
NAD	> 0.1 mmol/L
AIDH	> 300 U/L

Precautions
The reagents may contain sodium azide (< 0.1 %) as preservative. Do not swallow. Avoid contact with skin and mucous membranes. Take the necessary precautions for the use of laboratory reagents.

It is recommended to wash 10 ml glass vial with deionized sterile water between the reconstitutions

Reagent Preparation
Protocol for preparing the reagents R1 and R2 for the analyzer.

Preparing reagent R1:
- Pipette the full content (appr. 20 ml) of the BUF A to Lyo A vial.
- Let it completely dissolve by mixing gently. Avoid foaming.
- Pipette the solution completely back to the original BUF A vial.
- Insert the Reagent R1 to the analyzer using the vial barcode or insert it manually without the barcode.
- When not in use, ready R1 reagent should be stored capped at 2-8°C or it can be freezed once.

Preparing reagent R2:
- Pipette 1.6 ml from the BUF B vial to the Lyo B vial.
- Let it completely dissolve by mixing gently. Avoid foaming.
- Pipette the solution completely to the clean 10 ml vial included in the kit box.
- Insert the Reagent R2 to the analyzer using the vial barcode or insert it manually without the barcode.
- When not in use, ready R2 reagent should be stored capped at 2-8°C or it can be freezed once.

Note: Check that there are no bubbles on the surface of the reagent when you insert vials into the analyzer. Insert always without the vial cap.

Storage and Stability
Reagent R1 (Buffer A + Lyo A) reconstitution is stable for 7 days at 2...8°C. It is stable for 30 days frozen once at -20°C.

Reagent R2 (Buffer B + Lyo B) reconstitution is stable for 7 days at 2...8°C. It is stable for 30 days frozen once at -20°C.

Reagents in unopened vials are stable at 2…8 °C until the expiry date printed on the label. Do not freeze the reagents.

Refer to the Application Notes of your analyzer for the details of on board stability of the reagents.

SAMPLES

Sample Type
Food, beverage, e.g. beer, white wine and other sample material.

Other sample types may also be used. It is recommend to validate the method using spiked samples with a known amount of analyte to see the possible matrix effect of the sample.

Sample concentration and Arena/Gallery application
All method related details are in the separate application note.

If the Arena or Gallery applications have a primary dilution of, e.g. 1+9, this means that every sample is automatically first diluted with 1+9.

Sample preparation
- In general, use colorless, clear and neutral liquid samples directly.
- Filter or centrifuge turbid solutions.
- Adjust acid samples to pH 8 by adding sodium or potassium hydroxide solution and incubate for approx. 15 min.
- Treat strongly colored samples with polyvinylpolypyrrolidone (PVPP e.g. 1 g/100 ml Sample).

The Carrez-clarification should not be used due to evaporation of acetaldehyde during sample preparation.

It is recommended to use spiked samples to validate the sample preparation step.

TEST PROCEDURE
See a separate application for the Arena or Gallery analyzer.

Manual test procedure
Wavelength 340 nm, cuvette pathlength 1 cm, reading is done against air or distilled water at 37°C. This is an end-point reaction, 5 minutes to the end of reaction. Linearity for manual method is 1 – 100 mg/l at 37°C as Acetaldehyde.

Pipette prewarmed reagents in a cuvette using the table below.

	R/B	**ST**	**Sample**
Reconstituted R1	1000 µl	1000 µl	1000 µl
Distilled water	50 µl	-	-
Std	-	50 µl	-
Sample	-	-	50 µl
Mix and incubate for 3 min at 37 °C. Measure the absorbance AR/B1, AST1 and AS1. Then add:			
Reconstituted R2	25 µl	25 µl	25 µl
Mix carefully and incubate for 5 min at 37 °C. Read the absorbance AR/B2, AST2 and AS2.			

Calculate for the Reagent/Blank AR/B = (AR/B2 - AR/B1).
Calculate for the standard AST = (AST2 - AST1)
Calculate for the sample AS = (AS2 - AS1).
Calculate the difference ∆A = AS - AR/B.

Use this general formula to calculate the concentration:

$$\textbf{Acetaldehyde conc. (g/l)} = \frac{\textbf{AS-AS/B}}{\textbf{AST – AR/B}} \times \textbf{Standard value}$$

Materials required but not provided
Distilled water (aseptic and free of heavy metals) and general laboratory equipment.

Calibration
Acetaldehyde Standard Cat no 984396 can be used. Standard is ready to use.

Quality Control
It is recommended to use quality control samples at least once an hour and after each calibration and every time a new bottle of reagent is used. It is recommended to use two level of controls. The control intervals and limits must be adapted to the individual laboratory requirements. The results of the quality control sample(s) should fall within the limits pre-set by the laboratory.

CALCULATION OF RESULTS
The results are calculated automatically by the analyzer using a calibration curve.

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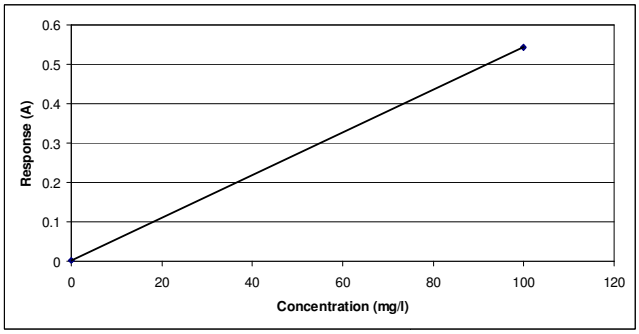
Conversion factors:
mmol/l x 44.05 = mg/l
mg/l x 0.0227 = mmol/l

Calibration Curve (example)



Calibrator	Response (A)	Calc. conc. (mg/l)
Water	0.0021	0
Acetaldehyde std	0.5421	100

Calibration factor of this example is 185.
Note that the calibration curve is lot dependent.

LIMITATIONS OF THE PROCEDURE

Interference

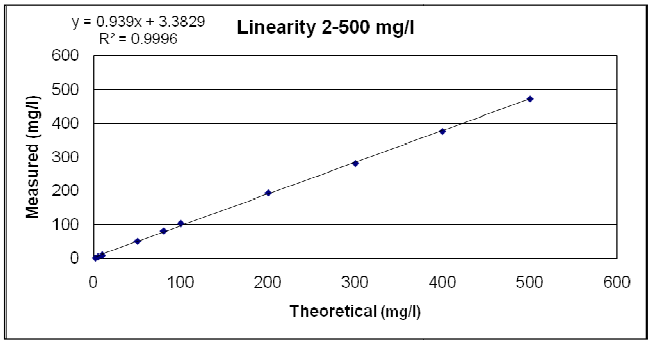
The determination is specific for Acetaldehyde.
Note: Red wine matrix or color may interfere the measurement. This sample type should be validated by the user.

MEASURING RANGE

The test has been developed to determine Acetaldehyde concentrations within a measuring range from 2 to 500 mg/l.

PERFORMANCE CHARACTERISTICS

The results obtained in individual laboratories may differ from the performance data given. Linearity testing has been performed with water based standard solutions. Different matrixes may change the linearity limits of the test.



Determination limit (=Test limit low)

The determination limit is the lowest concentration that can be measured quantitatively. The determination limit for this method is 2 mg/l.

Precision

Gallery analyzer

	Mean 33 mg/l Spiked beer		Mean 36 mg/l White wine	
	SD	CV %	SD	CV %
Within run	0.226	0.7	0.246	0.7
Between run	0.136	0.4	1.003	2.7
Total	0.263	0.8	1.032	2.8

A precision study was performed using Gallery, with the number of measurements being n = 30.

OTHER REMARKS

Note that the application performance has been verified with pure chemicals dissolved in deionized water and with spiked native samples. The results obtained in individual laboratories may differ from the given performance data due to e.g. sample matrix, concentrations or analysis environment. Each laboratory is responsible to verify the method to prove the analysis performance.

WASTE MANAGEMENT

Please refer to local legal requirements. It is recommended to empty the analyzer cuvette waste bin and waste water daily. Emptying should be done immediately after the analysis when using hazardous reagents/solutions.
Note: If using reagents/solutions that react with each other, cuvette waste bin and waste water should be emptied and washed between use of these reagents.

BIBLIOGRAPHY FOR METHOD

Beutler, H. -O. (1988). Acetaldehyde In Methods of Enzymatic Analysis (Bergmeyer, H. U., ed.), 3rd ed., Vol. VI, pp. 606-613, VCH Publishers (UK) Ltd., Cambridge, UK.

ADDITIONAL MATERIAL

Certificate of analysis and SDS are available at
www.e-labeling.eu/TSF

Applications for Gallery and Arena automated analyzers are available upon request from the local sales representative. Information in the Application note can change without prior notice.

MANUFACTURER

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CONTACT INFORMATION

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2015-04-28

Changes from previous version

Reagent information
General update

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