

EN

# L-LACTIC ACID

REF 984308

1	3 x 16 ml Reagent 1
2	3 x 4.5 ml Reagent 2

## INTENDED USE

Reagent for photometric determination of L-Lactic acid in homogenous liquid samples using automated Thermo Scientific Arena or Gallery analyzer.

## METHOD

Enzymatic test with L-Lactate-Dehydrogenase (L-LDH). Method is performed at 37 °C, using 340 nm filter.

## PRINCIPLE OF THE PROCEDURE

L-Lactat + NAD<sup>+</sup> <---L-LDH---> Pyruvat + NADH + H<sup>+</sup>

## REAGENT INFORMATION

Reagent 1 (R1) 3 x 16 ml

Reagent 2 (R2) 3 x 4.5 ml

**Note:** Labels of reagents vials have two barcodes.

For Arena analyzers, turn the short barcode on the left side to the barcode reader.

For Gallery analyzers, turn the long barcode on the right side to the reading position of the reagent rack.

## Concentrations

<b>R1</b>	Buffer	pH 9.0
	L-LDH	≥ 30 kU/l
<b>R2</b>	NAD	≥ 20 mmol/l

## Precautions

The reagents 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.

## Preparation

The reagents R1 and R2 are ready-to-use.

The kit contains one empty 20 ml vessel for sample blank water. Add 5 ml of distilled water to the vessel. Change the sample blank water once a day.

**Note:** Check that there are no bubbles on the surface of the reagent when you insert vials in the analyzer.

## Storage and Stability

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

Reagents are stable 30 days on board.

## SAMPLES

### Sample Type

Food and other sample material.

### Sample concentration and Arena/Gallery application

All method related details are in the separate application note.

Arena and Gallery applications have a primary dilution of 1+0. This means that automated dilution is not in use.

Primary dilution and the Dilution limits Low and High can be changed according to the example table below if needed.

Dilution 1+	Dilution limit (mg/l)	
	Low	High
2	60	600
9	200	1600

## Sample preparation

If the sample has substances interfering the measurement, please handle it according to the following suitable preparation procedure:

- Use clear, colorless and practically neutral liquid samples directly or after dilution to an L-Lactate concentration between 20 – 200 mg/l.
- Filter or centrifuge turbid solutions.
- Degas samples containing carbon dioxide.
- Crush or homogenize solid or semi-solid samples.
- Weigh sufficient quantity of sample in a volumetric flask (take care of the measuring range), extract with water and filtrate, centrifuge or use Carrez clarification if necessary.
- Weigh sufficient quantity of fat containing samples into a volumetric flask (take care of the measuring range), extract with hot water. Cool to allow the fat to separate, make up the mark, place the volumetric flask in an ice bath for 15 min. and filter. Alternatively use Carrez clarification after extraction.
- Adjust acid samples to pH 8 - 9 by adding sodium or potassium hydroxide solution and incubate for approx. 15 min.
- Treat strongly colored samples with polyvinylpyrrolidone (PVPP e.g. 1 g/100 ml Sample), or (if necessary adjusted to pH 9) measure instead with reagent blank (RB) each sample with sample blank (SB).
- **Carrez clarification:**  
Weigh sufficient quantity of the sample into a 100 ml volumetric flask which contains approx. 60 ml dist. water. Subsequently carefully add 5 ml Carrez-I-solution (potassium ferrocyanide, 85 mmol = 3.60 g K<sub>4</sub>[Fe(CN)<sub>6</sub>] × 3 H<sub>2</sub>O/100 ml), 5 ml Carrez-II-solution (zinc sulphate, 250 mmol = 7.20 g ZnSO<sub>4</sub> × 7 H<sub>2</sub>O/100 ml) and 10 ml 0.1 M NaOH. Mix after each addition. Fill the volumetric flask with water to the mark, mix and filter.

## TEST PROCEDURE

See a separate application for the Arena or Gallery analyzer.

## Materials required but not provided

Distilled water (aseptic and free of heavy metals) and general laboratory equipment.

Acid combination standard Cat no. 984382 (one level, water based) is not included in the kit.

## Calibration

Water based Acid combination standard can be used or other. Ordering code for Acid combination standard is 984382 (3x3 ml). The standard is ready-to-use.

## Quality Control

Use quality control samples at least once a day 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.

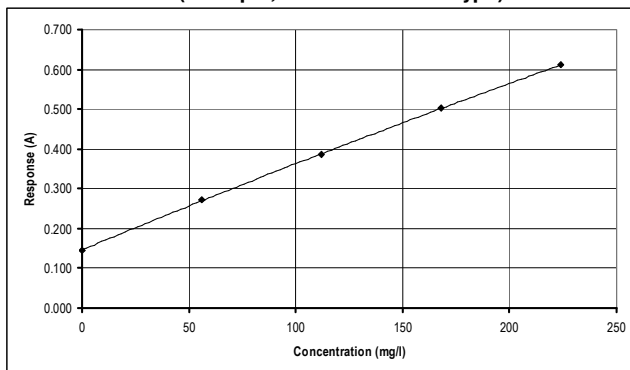
Available controls:

Acid combination standard can be used. If Acid combination standard is used also for calibration, an additional internal control is recommended to be used.

## CALCULATION OF RESULTS

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

Conversion factors:  
mg/l x 0.0111 = mmol/l  
mmol/l x 90.08 = mg/l

**Calibration Curve (example, non-linear curve type)**

Calibrator	Response (A)	Calc. conc. (mg/l)
Water	0.146	0.0
Acid std25	0.273	56.0
Acid std50	0.386	112.0
Acid std75	0.502	168.0
Acid std100	0.612	224.0

Note that the calibration curve is lot dependent.

**Preparation of the calibration standards.**

Concentration	STD (µl)	Distilled Water (µl)
0%	0	500
25%	125	375
50%	250	250
75%	375	125
100%	500	0

**LIMITATIONS OF THE PROCEDURE****Interference**

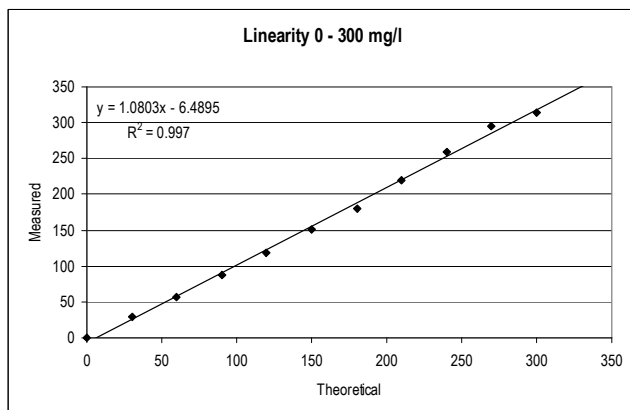
The determination is specific for L-Lactic acid. D-Lactic acid does not react.

**MEASURING RANGE**

The test has been developed to determine L-Lactic acid concentrations within a measuring range from 20 to 1600 mg/l.

**PERFORMANCE CHARACTERISTICS**

The results obtained in individual laboratories may differ from the performance data given.

**Determination limit (=Test limit low)**

The determination limit is the lowest concentration that can be measured quantitatively.

The determination limit for this method is 20 mg/l.

**Precision****Arena analyzer**

	Mean 64 mg/l		Mean 184 mg/l	
	SD	CV %	SD	CV %
Within run	0.60	0.9	1.00	0.6

**Gallery analyzer**

	Mean 26 mg/l		Mean 125 mg/l		Mean 182 mg/l	
	SD	CV %	SD	CV %	SD	CV %
Within run	0.662	2.0	1.605	1.3	2.681	1.5
Between run	0.789	3.0	1.570	1.3	1.631	0.9
Total	1.029	4.0	2.246	1.8	3.138	1.7

A precision study was performed using Gallery for 5 days, with the number of measurements being n = 50.

**WASTE MANAGEMENT**

Please refer to local legal requirements. Empty the cuvette waste bin daily immediately after the analysis.

**OTHER REMARKS**

All results must be verified by laboratory quality control samples.

Manufacturer does not warrant that the product is error-free or will accomplish any particular result. In no event shall the manufacturer be liable for special, incidental, indirect, punitive or consequential damages (including, but not limited to, loss of profits, loss of goodwill, loss of data or loss of use damages) arising out of the use or disposition of the products.

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**Changes from previous version**

Gallery information added.