

## Arabinose Assay for Cedex Bio and Bio HT Analyzers

### *Reliable and convenient automated determination*

Producing recombinant proteins using an E. coli expression system with the pBAD promoter, the expression can be regulated by the dose-dependent induction with a specific concentration of arabinose.

Some proteins are hard to produce due to their cell toxicity or limited solubility. Different to other expression systems, the ability to precisely regulate the expression level by a specific arabinose concentration enables to find an optimal compromise between maximal product yield and prevention of system failure due to cell death or loss of the protein.

Arabinose serves for induction of the protein expression and at the same time it is rapidly consumed by the bacteria as source of energy and carbon. Therefore, the arabinose concentration needs to be determined in short intervals and has to be adapted continuously by appropriate feeding.

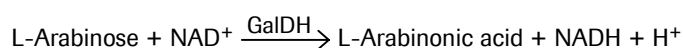
Automated testing on Cedex Analyzers enables fast and easy arabinose monitoring, for perfect process control achieving optimal yield.



For use in quality control/manufacturing process only.

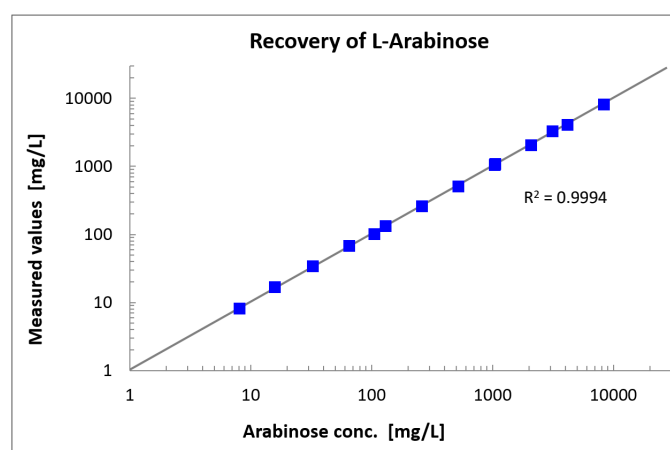
### Assay principle

In the Cedex assay, L-arabinose is oxidized by nicotinamide adenine dinucleotide (NAD) in presence of  $\beta$ -galactose dehydrogenase (GalDH), an enzyme that converts D-galactose and L-arabinose as well. The amount of NADH formed in this reaction is measured photometrically at 340 nm and is directly proportional to the amount of L-arabinose in the sample.



### Process control based on fast and reliable analytics

- High accuracy, results are consistent to HPLC
- No sample filtration or other pretreatment required
- Wide measuring range, option for on-board dilution
- Barcoded reagents, ready-to-use
- Calibration required only once per lot



**Figure 1:** The recovery of L-arabinose standard solutions on a Cedex Bio HT Analyzer shows a perfect accuracy and test linearity. (Evaluation data of Roche Diagnostics)

## Wide test range, low sample volume

Protocol	Arabinose range	Sample vol.
ARAB low range	0.055 – 27.8 mmol/L, 8.3 – 4 166 mg/L	5 µL
ARAD high range	0.55 – 278 mmol/L, 83 – 41 661 mg/L, up to max. solubility with auto-dilution	20 µL

## High specificity

The arabinose assay shows no crossreactivity with other carbohydrates in the list below, except of D-galactose and 2-deoxy-D-galactose, which are chemically very similar to L-arabinose. However, these substances are not common in E. coli culture media, therefore, there is no risk of interference.

Calculated results in the arabinose test:

- **L-Arabinose**, relative recovery = **1.00**
- D-Galactose, relative recovery = 1.00
- 2-Deoxy-D-galactose, relative recovery = 0.27

No reaction in the arabinose test:

- D-Arabinose
- L-Fucose
- D-Fructose
- L-Galactose
- D-Galactose-6-Phosphate
- D-Galacturonic acid
- D-Glucose
- D-Glucuronic acid
- Lactose
- Maltose
- Melibiose
- Raffinose
- D-Ribose
- Stachyose
- Sucrose
- Trehalose
- D-Xylose

## High precision

	Level 1	Level 2	Level 3
Mean	0.7 mmol/L, 105 mg/L	7 mmol/L, 1051 mg/L	21 mmol/L, 3153 mg/L
CV in-run	0.8%	1.2%	0.7%
CV inter-run	3.6%	2.8%	3.5%

Arabinose was determined in spiked culture media samples. Coefficients of variation (CV) were calculated for in-run precision (n=21) and inter-run precision (on 10 days). Representative performance data for the Cedex Bio HT Analyzers are shown. Results obtained in individual laboratories may differ.

(Evaluation data of Roche Diagnostics)

## Ordering information

For determination of arabinose, the following products are required in addition to the Cedex instrument with the general system reagents and accessories:

Product	Pack size	Catalog no.
Galactose/Arabinose Bio	4 x 50 tests	08 391 599 001
Galactose/Arabinose Bio HT	200 tests	08 391 629 001
Calibrator D Bio	6 x 1 ml	07 368 321 001
Control D Level 1 Bio	6 x 1 ml	07 368 178 001
Control D Level 2 Bio	6 x 1 ml	07 368 186 001
Control D Level 3 Bio	6 x 1 ml	07 368 194 001

## Regulatory disclaimer

For use in quality control/manufacturing process only.

## Trademarks

CEDEX is a trademark of Roche.

[custombiotech.roche.com/cedex](http://custombiotech.roche.com/cedex)

Please contact your local CustomBiotech representative

### Europe, Middle East, Africa, Latin America

Phone +49 621 759 8580  
Fax +49 621 759 6385  
mannheim.custombiotech@roche.com

### United States

Phone +1 800 428 5433, ext. 14649 (toll-free)  
Fax +1 317 521 4065  
custombiotech.ussales@roche.com

### Canada

Phone +1 450 686 7050  
Fax +1 450 686 7012  
custombiotech.can@roche.com

### Japan

Phone +81 3 6634 1046  
Fax +81 3 5479 0585  
japan.custombiotech@roche.com

### Asia Pacific

Phone +65 6371 6638  
Fax +65 6371 6601  
apac.custombiotech@roche.com

### Published by

Roche Diagnostics GmbH  
Sandhofer Straße 116  
68305 Mannheim  
Germany

© 2021 Roche Diagnostics GmbH  
All rights reserved.