



Arabinose Assay for Cedex Bio & Bio HT Analyzers

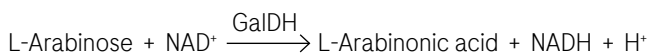
Reliable and convenient automated determination

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.

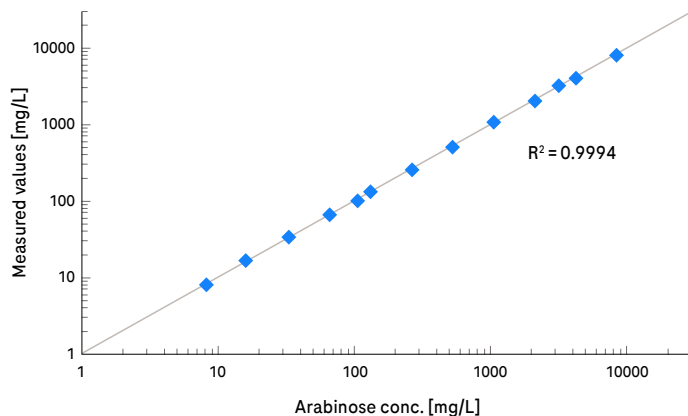
Assay principle

In the Cedex assay, L-arabinose is oxidized by nicotinamide adenine dinucleotide (NAD) in presence of β -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



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Recovery of Arabinose. 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 of the listed carbohydrates, except of D-galactose and 2-deoxy-Dgalactose, 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.

Positive signal in the galactose 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 galactose test:

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



High precision

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)

	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	6.6 %	2.8 %	3.5 %

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 Number
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.

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