

LB Broth Autoinducible with Trace Element

Cat. 2114

For expression of IPTG-inducible bacterial strains.

Practical information

Applications	Categories
Protein expression	Escherichia coli

Industry: Molecular biology

Principles and uses

LB Broth Autoinducible with Trace Element is a medium which supports a high cell density and, in the case is formulated for the optimum growth of E.coli, maintains growth in the logarithmic phase for a long time. As a result, it yields a greater number of recombinant proteins and plasmic DNA.

Autoinduction Media (AIM) was first formulated and developed by W. studier to grow IPTG-inducible expression strains. The principle of AIM is based on carbon sources in the medium that are metabolized differentially to promote high density cell growth and automatically induce protein expression from lac promoters. AIM contains glucose as well as lactose as the carbon source. A limited concentration of glucose is metabolized preferentially during growth, which prevents uptake of lactose until the glucose is depleted, usually in mid to late log phase. As the glucose is depleted, lactose can be taken up and converted by the enzyme β -galactosidase to the inducer allolactose. Allolactose causes the release of lac repressor from its specific binding sites in the DNA and thereby induces expression of T7 RNA polymerase from the lacUV5 promoter and unblocks T7lac promoters, allowing expression of target proteins by T7 RNA polymerase. With AIM media, a high density cell growth is followed by a spontaneous induction of protein expression. There is no need to monitor the cell density and there is no conventional induction with IPTG. Parallel growth of many non-induced or auto-induced cultures is feasible because cultures are simply inoculated and grown to saturation. This is a great convenience and simplifies manual or automated induction and analysis of multiple clones compared to conventional IPTG induction, which requires monitoring growth of each culture and adding inducer at the proper stage of growth.

Tryptone provide nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is source of vitamins, particularly the B-group. Potassium phosphates act as a buffer system to prevent cell death. Its formulation is characterized by the presence of trace elements which supply all of the specific requirements for the bacteria.

Formula in g/L

Glucose	0,5	Ammonium sulfate	3,3
Disodium phosphate	7,1	Magnesium sulfate	0,15
Monopotassium phosphate	6,8	Tryptone	10
Yeast extract	5	Trace elements	0,015
Alpha lactose	2		

Preparation

Suspend 34,9 grams of medium in one liter of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for one minute until complete dissolution. Sterilize in autoclave at 121 °C for 15 minutes. Mix well and dispense as wished.

Instructions for use

- Carry out the experimental procedure according to appropriate use or purpose.
- Inoculate and incubate at a temperature of 35 ± 2 °C for 18-48 hours.

Quality control

Solubility	Appareance	Color of the dehydrated medium	Color of the prepared medium	Final pH (25°C)
w/o rests	Fine powder	Beige	Amber	7,0 \pm 0,2

Microbiological test

Incubation conditions: (35±2 °C / 18-48 h).

Microrganisms	Specification
Escherichia coli ATCC 23724	Good growth
Escherichia coli ATCC 33694	Good growth
Escherichia coli ATCC 33849	Good growth
Escherichia coli ATCC 39403	Good growth
Escherichia coli ATCC 47014	Good growth

Storage

Temp. Min.:2 °C
Temp. Max.:25 °C

Bibliography

Studier, F. W. 2005. Protein production by auto-induction in high-density shaking cultures. Protein expression and purification 41: 207-234