

IPTG Solution (100 mg/mL, Sterile-Filtered)

Cat. No.: I1524602 | Pack size: 5 mL | Storage: -20 °C, protected from light

Overview

IPTG, full name Isopropyl β -D-1-thiogalactopyranoside, is commonly known as isopropyl β -D-1-thiogalactopyranoside, which is widely applied in the blue-white screening assay for Escherichia coli. Neither the host strain nor the fragment encoded by the plasmid alone possesses β -galactosidase activity. Nevertheless, when both coexist, the α -fragment and ω -fragment can undergo α -complementation to assemble enzymatically active β -galactosidase. When induced by IPTG and in the presence of the chromogenic substrate X-Gal, bacteria carrying the intact LacZ gene via α -complementation will form blue colonies. In contrast, insertion of exogenous foreign DNA into the multiple cloning site (MCS) of the plasmid disrupts the coding sequence of the α -fragment. As a result, bacterial cells harboring recombinant plasmids with inserted target DNA yield white colonies. This screening method for recombinant clones is defined as blue-white screening. In addition, IPTG serves as an inducer for protein expression from expression vectors driven by promoters such as lac or tac. This product is sterilized by filtration through a 0.22 μ m membrane filter and can be directly added to culture media for use.

Product Composition:

Component	Molecular Formula/CAS No./Molecular Weight	Formulation	Sterilization Method
Isopropyl β -D-1-thiogalactopyranoside (IPTG)	C ₉ H ₁₈ O ₅ S/367-93-1/238.30	1 mol/L or 100 mg/mL	Sterilization by 0.22 μ m membrane filtration
Double Distilled Deionized Water (ddH ₂ O)	H ₂ O/7732-18-5/18.015	—	—

Product Contents:

Package Name	CAT#	Unit Package	Content per Unit	Storage Condition	Shelf Life
IPTG Solution (1M, Sterile-Filtered)	I1524601	5 mL	1 Bottle	-20°C, Protect from Light	24 Months
IPTG Solution (100 mg/mL, Sterile-Filtered)	I1524602	5 mL	1 Bottle	-20°C, Protect from Light	24 Months

Operating Protocols:

I. Protocol for Blue-White Screening

1. Pour agar plates: Melt LB solid medium in a microwave oven or cool autoclaved medium to below 55 °C. Add 200 µL of 20 mg/mL X-gal solution, 40 µL of 100 mg/mL IPTG solution and the corresponding antibiotic solution to every 100 mL medium, mix thoroughly and pour plates.
2. Alternative method: Spread X-gal and IPTG directly onto the surface of pre-poured LB plates. For a 90 mm-diameter plate (containing approximately 20 mL medium), add 40 µL of 20 mg/mL X-gal solution and 8 µL of 100 mg/mL IPTG solution, then spread evenly with a sterile spreader.

II. Protocol for Prokaryotic Protein Induction and Expression

Culture the prokaryotic expression strain at 37 °C with shaking at 200 rpm until the OD₆₀₀ reaches 0.5–0.6. Transfer roughly 3 mL bacterial suspension as blank control, then add IPTG solution to the remaining culture. Optimal IPTG concentration, incubation temperature and induction duration vary for different target proteins and must be optimized empirically to obtain sufficient target protein. The routinely used IPTG concentration ranges from 0.1 mM to 20 mM, with 1 mM as the standard initial induction concentration. A concentration gradient can be set as follows: 0.1 mM, 0.2 mM, 0.5 mM, 1 mM, 2 mM, 5 mM, 10 mM, 20 mM.

III. Preparation of 1 M IPTG Stock Solution

Dissolve 2.38 g IPTG in deionized water and bring the final volume to 10 mL. After complete dissolution, sterilize the solution by filtration with a 0.22 µm filter membrane.

IV. Preparation of 100 mg/mL IPTG Stock Solution

Dissolve 1 g IPTG in deionized water and adjust the total volume to 10 mL. Once fully dissolved, perform sterile filtration using a 0.22 µm filter membrane.

Precautions

1. Precipitation may occur in filter-sterilized IPTG solution when the temperature drops. If precipitate appears, place the IPTG solution in a 37 °C environment for preheating to redissolve the sediment, or shake vigorously to facilitate dissolution.
2. Unopened filter-sterilized IPTG solution can be stored at -20 °C for 2 years. Discontinue use immediately if bacterial contamination is observed after opening.

Specifications

Attribute	Value
Specifications & Purity	Sterile-filtered, BioReagent, for Microscopy, ≥99%, 100 mg/mL in water
CAS No.	367-93-1
English Name	IPTG (Isopropyl β-D-1-Thiogalactopyranoside)
Chinese Name	Isopropyl β-D-1-thiogalactopyranoside
Molecular Weight	238.31
Molecular Formula	C ₉ H ₁₈ O ₅ S
Appearance	White crystal or powder
Solubility	Freely soluble in water
Stability And Storage	Store at -20°C long term (24 months).Store in the dark.
Storage	Protected from light, Store at -20°C
Shipped In	Ice chest + Ice pads. This product requires cold chain shipping. Ground and other economy services are not available.
Grade	BioReagent, for Microscopy, Sterile-filtered
Purity	≥99%

Names and Identifiers

Attribute	Value
CAS No.	367-93-1
EC Number	206-703-0
Beilstein Registry Number	4631
Isomeric SMILES	<chem>CC(C)S[C@H]1[C@@H]([C@H]([C@H]([C@H](O1)CO)O)O)O</chem>
WGK Germany	2
Molecular Weight	238.3
Beilstein	4631
Reaxys-Rn	11730049
Reaxys-RN_link_address	https://www.reaxys.com/reaxys/secured/hopinto.do?context=S&query=IDE.XRN=11730049&ln=

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Limitations & Disclaimer

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