Thioglycollate Medium, Brewer Modified

Enriched Reducing Medium for Anaerobic, Microaerophilic, and Facultative Anaerobic Cultivation

Catalogue Number: AS-1364

Application	Medium Type	Typical pH	HS Code
Anaerobic & sterility testing	Enriched reducing broth	7.1 ± 0.2 at 25 °C	3821.00.00

Overview

Thioglycollate Medium, Brewer Modified is an enriched, reducing culture medium designed for the cultivation of obligate anaerobes, microaerophiles, and facultative anaerobes. The Brewer modification enhances anaerobic performance through optimised concentrations of sodium thioglycollate and L-cystine as dual reducing agents, creating a sufficiently low oxidation-reduction potential to support strict anaerobes without requiring anaerobic jars or chambers in routine tube culture.

The medium incorporates resazurin as a visual redox indicator — the characteristic pink-to-colourless colour change allows real-time monitoring of oxygen penetration depth during incubation. The semi-solid agar content (0.5 g/L) retards convection currents and maintains an oxygen gradient, enabling simultaneous growth of both aerobic and anaerobic organisms in different zones of the same tube.

Widely used in clinical microbiology, pharmaceutical sterility testing (BP/USP/EP), and anaerobic research, this medium meets the requirements of the Fluid Thioglycollate Medium described in major pharmacopoeia for sterility testing of pharmaceutical and medical device products.

Principle of the Medium

Pancreatic Digest of Casein (15.0 g/L)	Rich source of peptides, amino acids, and nitrogen to support fastidious and nutritionally demanding anaerobes
Yeast Extract (5.0 g/L)	Supplies B-group vitamins, nucleotides, coenzymes, and growth factors essential for anaerobic metabolism
Dextrose / D-Glucose (2.5 g/L)	Fermentable carbohydrate — energy source for glucose-fermenting anaerobes; also acts as a mild reductant
Sodium Chloride (5.0 g/L)	Osmotic balance compatible with most clinical and environmental organisms

Sodium Thioglycollate (0.5 g/L)	Primary reducing agent — scavenges dissolved oxygen, lowers Eh to support obligate anaerobes
L-Cystine (0.5 g/L)	Secondary reducing agent and sulfur source — enhances reducing capacity; supports cystine-requiring organisms
Resazurin (0.001 g/L)	Redox indicator: colourless/white (reduced, anaerobic) → pink (oxidised, aerobic). Visual monitor of oxygen penetration depth
Agar (0.5 g/L)	Semi-solid concentration — retards convection, maintains oxygen gradient, enables positional growth pattern interpretation

Typical Composition (per litre)

Ingredient	CAS Number	Function	Amount (g/L)
Pancreatic Digest of Casein	73049-73-7	Nitrogen, peptides, amino acids	15.0
Yeast Extract	8013-01-2	Vitamins, growth factors, nucleotides	5.0
Dextrose (D-Glucose)	50-99-7	Fermentable carbohydrate, reductant	2.5
Sodium Chloride	7647-14-5	Osmotic balance	5.0
Sodium Thioglycollate	367-51-1	Primary reducing agent — O_2 scavenger	0.5
L-Cystine	56-89-3	Secondary reducing agent, sulfur source	0.5
Resazurin	62758-13-8	Redox indicator (colorimetric)	0.001
Agar (semi-solid)	9002-18-0	Retards convection; oxygen gradient	0.5
Purified Water	7732-18-5	Solvent	q.s. 1 L

Total (without water): ~28.5 g/L | Final pH: 7.1 ± 0.2 at 25 °C

Key Features

- Dual reducing system — sodium thioglycollate + L-cystine creates a robust anaerobic environment
- Resazurin redox indicator — visual, real-time monitoring of oxygen penetration depth
- Semi-solid agar — maintains oxygen gradient for positional growth pattern interpretation

- Pharmacopoeial-grade medium — meets USP, BP, and EP Fluid Thioglycollate Medium requirements for pharmaceutical sterility testing
- Brewer modification — enhanced reducing capacity supports strict obligate anaerobes
- Nutrient-rich formulation — casein digest + yeast extract supports fastidious organisms
- Versatile format — suitable for tubes, bottles, and flasks

Applications

Pharmaceutical Sterility Testing

- Sterility testing of pharmaceutical products per USP <71>, BP 2023, and EP 2.6.1
- Medical device and parenteral product sterility testing
- Sterility testing of biologics, vaccines, and blood products
- Pharmacopoeial membrane filtration and direct inoculation sterility methods

Clinical Microbiology

- Cultivation and enrichment of obligate anaerobes from clinical specimens (blood, wound, abscess)
- Isolation and propagation of microaerophilic organisms
- Enrichment broth for slow-growing or fastidious anaerobic pathogens
- Blood culture supplementation and enrichment

Research & Environmental

- Anaerobic microbial physiology and metabolism studies
- Enrichment and propagation of environmental anaerobes from soil, sediment, and water
- Fermentation research and obligate anaerobe culture maintenance

Preparation Instructions

1. Dissolve 28.5 g of dehydrated medium in 1 litre of purified water.
2. Mix with gentle heating until completely dissolved — avoid vigorous boiling.
3. Adjust pH to 7.1 ± 0.2 at 25 °C if required.
4. Dispense into tubes (10–15 mL per tube) or bottles as required. For sterility testing, use pharmacopoeially specified volumes.
5. Sterilise by autoclaving at 121 °C for 15 minutes.
6. Cool to 45–50 °C and dispense if required, or cool to room temperature.
7. Before use, heat the medium in a boiling water bath or steamer for 10–15 minutes to drive off dissolved oxygen. Cool rapidly without shaking.
8. The top 20–30% of the medium may appear pink (resazurin oxidation) — this is normal. Only use tubes with a pink layer of ≤ 1/3 of the total depth. Discard tubes where more than 1/3 is pink.

PRODUCT DESCRIPTION

AS-1364 | Thioglycollate Medium, Brewer Modified

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CRITICAL: For pharmaceutical sterility testing — use only medium that is colourless or at most faintly pink in the upper layer. Follow pharmacopoeial preparation and validation requirements. Do not overheat.

Incubation & Interpretation

Incubation conditions:

Temperature	30–35 °C (pharmaceutical sterility testing); 35–37 °C (clinical/research)
Duration	14 days (USP/BP/EP sterility testing); 24–72 h (routine culture); 5–7 days (slow-growing anaerobes)
Atmosphere	Ambient (no special anaerobic atmosphere required for thioglycollate broth)

Growth pattern interpretation:

Observation	Organism Type	Significance
Growth along tube bottom only — clear upper layer	Obligate anaerobes	Oxygen-sensitive strict anaerobes (e.g. Clostridium, Bacteroides)
Growth throughout tube uniformly	Facultative anaerobes	Grow with or without oxygen (e.g. E. coli, staphylococci)
Growth at or near surface only — clear lower layer	Obligate aerobes or microaerophiles	Require or prefer oxygen (e.g. Pseudomonas, Campylobacter)
Pink colour extending >1/3 from top	Oxygen penetration	Discard — medium is over-oxidised for strict anaerobe work
No growth after 14 days	Sterile (pharmaceutical testing)	Pass — product meets sterility requirement
Any growth after 14 days	Not sterile	Fail — investigate and report per pharmacopoeial requirements

Storage & Stability

Dehydrated powder	15–30 °C, tightly sealed, dry, original container

Protect from	Moisture, heat, light
Prepared medium	2–8 °C, protected from light, minimise oxygen exposure
Before use	Heat prepared medium in boiling water bath 10–15 min, cool rapidly before inoculation
Shelf life (powder)	As per labelled expiry date
Discard if	>1/3 of prepared tube is pink before inoculation

Quality & Compliance

Meets the requirements for Fluid Thioglycollate Medium as described in USP <71> (Sterility Tests), BP 2023, and EP 2.6.1. Performance tested against ATCC reference organisms prior to release. Manufactured under controlled conditions for batch-to-batch consistency.

Customs & Trade Information

HS / AHECC Code	3821.00.00
Description	Prepared culture media for development or maintenance of microorganisms
Country of Origin	Australia

Disclaimer

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