# THIOGLYCOLLATE MEDIUM w/ and w/o ADDITIVES

## INTENDED USE
Remel Thioglycollate Medium w/ and w/o Additives are liquid media recommended for use in qualitative procedures as general purpose media for the cultivation of aerobes and anaerobes.

## SUMMARY AND EXPLANATION
Thioglycollate Medium was first described by Brewer in 1940.[1] This medium contained a small amount of agar and a reducing substance to initiate the growth of anaerobes. Thioglycollate media without dextrose are carbohydrate-free media suitable for preparing specific carbohydrate media for fermentation studies of bacteria.[2]

## PRINCIPLE
Sodium thioglycollate is a reducing agent which removes molecular oxygen from the medium and prevents the accumulation of peroxides which may be lethal to some microorganisms. Sulfhydryl groups inactivate mercury and other heavy metals neutralizing the antibacterial effect of some preservatives. A small amount of agar is added to impede diffusion of oxygen. Casein peptone and cystine supply nitrogen and carbon compounds essential for the growth of aerobes and anaerobes. Sodium chloride is a source of essential electrolytes and maintains osmotic equilibrium. The following additives may be incorporated in thioglycollate media: hemin as a source of X factor which stimulates the growth of many fastidious organisms and vitamin K which is a growth requirement for some *Bacteroides* species and gram-positive sporeformers.

## REAGENTS (CLASSICAL FORMULAE)*
**Thioglycollate Medium w/o Indicator w/ Dextrose:**

| | | | |
|---|---|---|---|
| Casein Peptone | 17.0 g | Sodium Thioglycollate | 0.5 g |
| Dextrose | 6.0 g | L-Cystine | 0.25 g |
| Soy Peptone | 3.0 g | Sodium Sulfite | 0.1 g |
| Sodium Chloride | 2.5 g | Agar | 0.7 g |
| | | Demineralized Water | 1000.0 ml |

pH 7.0 ± 0.2 @ 25°C

**Thioglycollate Medium w/o Indicator w/ Dextrose w/ Vitamin K w/ Hemin:**

| | | | |
|---|---|---|---|
| Casein Peptone | 17.0 g | L-Cystine | 0.25 g |
| Dextrose | 6.0 g | Sodium Sulfite | 0.1 g |
| Soy Peptone | 3.0 g | Hemin | 5.0 mg |
| Sodium Chloride | 2.5 g | Vitamin K | 0.1 mg |
| Sodium Thioglycollate | 0.5 g | Agar | 0.7 g |
| | | Demineralized Water | 1000.0 ml |

pH 7.0 ± 0.2 @ 25°C

**Thioglycollate Medium w/o Indicator w/o Dextrose:**

| | | | |
|---|---|---|---|
| Casein Peptone | 20.0 g | Sodium Thioglycollate | 0.5 g |
| Sodium Chloride | 2.5 g | Agar | 0.75 g |
| L-Cystine | 0.5 g | Demineralized Water | 1000.0 ml |

pH 7.1 ± 0.2 @ 25°C

*Adjusted as required to meet performance standards.

## PROCEDURE
1. Liquid media for anaerobic incubation should be reduced prior to inoculation by one of the following methods:
2. Place tubes with caps loosened in an anaerobic environment for 18-24 hours prior to use.
3. Boil tubes with caps loosened and cool to room temperature before inoculation.
4. Consult appropriate references for the recommended procedure for sample inoculation and cultivation.
5. Incubate inoculated medium in ambient air at 33-37°C for 24 hours to 7 days or following established laboratory procedures.
6. Turbidity or growth in Thioglycollate Medium should be confirmed by Gram stain and growth following subculture to appropriate medium.

## QUALITY CONTROL
All lot numbers of Thioglycollate Medium w/ and w/o Additives have been tested using the following quality control organisms and have been found to be acceptable. This quality control testing meets or exceeds CLSI standards.[3] Testing of control organisms should be performed in accordance with established laboratory quality control procedures. If aberrant quality control results are noted, patient results should not be reported.

**Thioglycollate Medium w/o Indicator w/ Dextrose w/ Vitamin K w/ Hemin:**

| CONTROL | INCUBATION | RESULTS |
|---|---|---|
| **Bacteroides vulgatus* ATCC® 8482 | Ambient, 48 h @ 33-37°C | Good growth |
| *Clostridium perfringens* ATCC® 13124 | Ambient, 48 h @ 33-37°C | Good growth |
| *Escherichia coli* ATCC® 25922 | Ambient, 24 h @ 33-37°C | Good growth |
| **Peptostreptococcus anaerobius* ATCC® 27337 | Ambient, 48 h @ 33-37°C | Good growth |
| **Staphylococcus aureus* ATCC® 25923 | Ambient, 24 h @ 33-37°C | Good growth |

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**Thioglycollate Medium w/o Indicator w/ Dextrose and Thioglycollate Medium w/o Indicator w/o Dextrose:**

| CONTROL | INCUBATION | RESULTS |
|---|---|---|
| **Bacteroides fragilis* ATCC® 25285 | Ambient, 48 h @ 33-37°C | Good growth |
| *Clostridium perfringens* ATCC® 13124 | Ambient, 48 h @ 33-37°C | Good growth |
| *Escherichia coli* ATCC® 25922 | Ambient, 24 h @ 33-37°C | Good growth |
| **Staphylococcus aureus* ATCC® 25923 | Ambient, 24 h @ 33-37°C | Good growth |

*CLSI recommended organism

## LIMITATIONS

1. A slight turbidity (haziness) may be present due to the small amount of agar in the medium.
2. When the medium has been boiled, it is clear. Do not boil more than once; frequent boiling results in the development of toxic products.[4]

## BIBLIOGRAPHY


1. Brewer, J.H. 1940. J. Am. Med. Assoc. 115:598.
2. Gibbons, R.J. and J.B. MacDonald. 1961. J. Bacteriol. 80:164-170.
3. Clinical and Laboratory Standards Institute (CLSI). 2004. Quality Control for Commercially Prepared Microbiological Culture Media; Approved Standard, 3rd ed. M22-A3. CLSI, Wayne, PA.
4. MacFaddin, J.F. 1985. Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria. Vol. 1. Williams & Wilkins, Baltimore, MD.


Refer to the front of Remel *Technical Manual of Microbiological Media* for **General Information** regarding precautions, product storage and deterioration, specimen collection, storage and transportation, materials required, quality control, and limitations.




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