Phenol Red Broth Base, Granulated

Phenol Red Broth Base, granulated is used as a basal medium to which carbohydrates are added for determination of fermentation reactions of pure cultures of microorganisms.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proteose peptone</td>
<td>10.000</td>
</tr>
<tr>
<td>Beef extract</td>
<td>1.000</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>5.000</td>
</tr>
<tr>
<td>Phenol red</td>
<td>0.018</td>
</tr>
<tr>
<td>Final pH (at 25°C)</td>
<td>7.4±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters**

**Directions**

Suspend 16.02 grams in 1000 ml purified / distilled water. Heat if necessary to dissolve the medium completely. Mix well and dispense in tubes containing inverted Durham's tubes and sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Aseptically add filter sterilized or autoclave sterilized desired amount of carbohydrate solution to sterile basal medium.

**Principle And Interpretation**

Phenol Red Broth Medium is formulated as per Vera (2) and is recommended to determine the fermentation reaction of carbohydrates for the differentiation of microorganisms (3, 4, 5). Phenol Red Broth Medium with various added carbohydrates serves as a differential medium by aiding in differentiation of various species and genera by their ability to ferment the specific carbohydrate, with the production of acid or acid and gas (6).

Phenol Red Broth Base is a complete medium without added carbohydrate, which can be used with the addition of 5-10 %, desired carbohydrate. It is used as a negative control for studying fermentations or as a base for the addition of carbohydrates. Proteose peptone and beef extract serve as sources for carbon and nitrogen. Sodium chloride is the osmotic stabilizer. Phenol red is the pH indicator, which turns yellow at acidic pH. Gas formation is seen in Durhams tubes. All of the Enterobacteriaceae grow well in this medium. In addition to producing a pH colour shift, the production of mixed acids, notably butyric acids, often results in a pungent, foul odour from the culture medium (1).

**Quality Control**

**Appearance**
Light yellow to pink coloured granular medium

**Colour and Clarity of prepared medium**
Red coloured clear solution without any precipitate

**Reaction**
Reaction of 1.6% w/v aqueous solution at 25°C. pH : 7.4±0.2

**pH**
7.20-7.60

**Cultural Response**
Cultural characteristics observed after an incubation at 35 - 37°C for 18 - 24 hours (longer if necessary)

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Growth without carbohydrate, (Acid)</th>
<th>without carbohydrate, (Gas)</th>
<th>with dextrose, (Acid)</th>
<th>with dextrose, (Gas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrobacter freundii ATCC 8090</td>
<td>50-100</td>
<td>luxuriant</td>
<td>Negative reaction, no colour change</td>
<td>Negative reaction</td>
<td>Positive reaction, yellow reaction colour</td>
</tr>
</tbody>
</table>
### Escherichia coli ATCC 25922
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Enterobacter aerogenes ATCC 13048
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Klebsiella pneumoniae ATCC 13883
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Proteus vulgaris ATCC 13315
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Salmonella Typhi ATCC 6539
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Salmonella Typhimurium ATCC 14028
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Serratia marcescens ATCC 8100
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Positive reaction, yellow reaction color

### Shigella flexneri ATCC 12022
- Growth: 50-100 luxuriant
- Reaction: Negative, no colour change
- Colour: Negative reaction
- Other: Positive, Negative reaction, yellow reaction color

## Storage and Shelf Life
Store below 30°C in tightly closed container and the prepared medium at 2-8°C. Use before expiry date on the label.

## Reference

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