Hydrogen sulphide production test

- Some bacteria have the ability to produce (H2S) gas from sulpher-containing amino acids by the action of bacterial enzyme.

C : H2S -ve= e.g. *E. coli.*
3 : H2S +ve e.g. *proteus.*

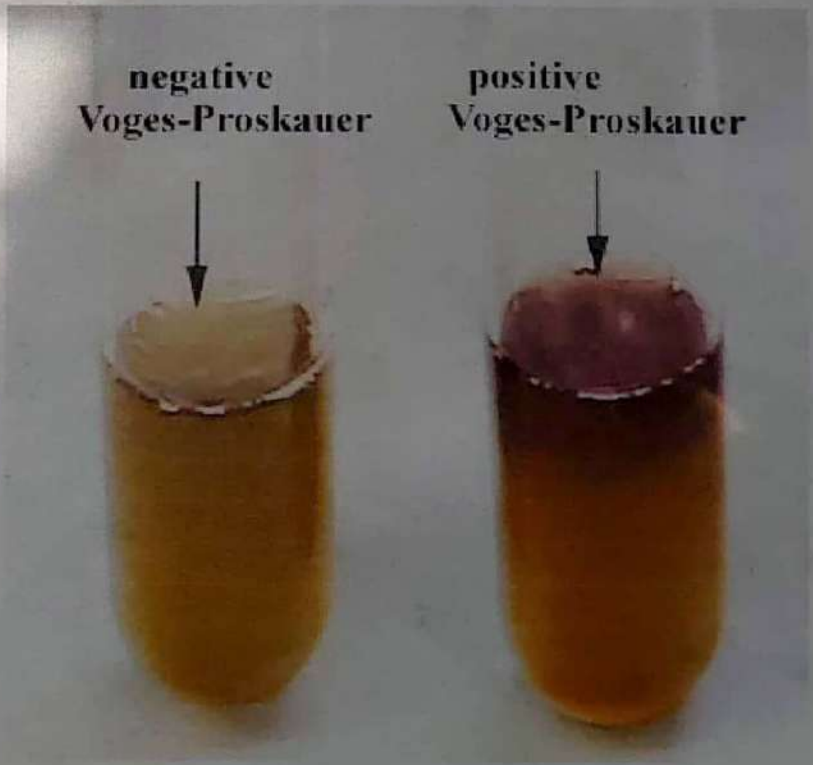
Voges-Proskauer (V-P) test

- Some bacteria ferment carbohydrates with production of acetyl carbinol and less quantity of acids insufficient to lower the Ph and to produce a color change.

- **Medium:** Glucose phosphate peptone water.

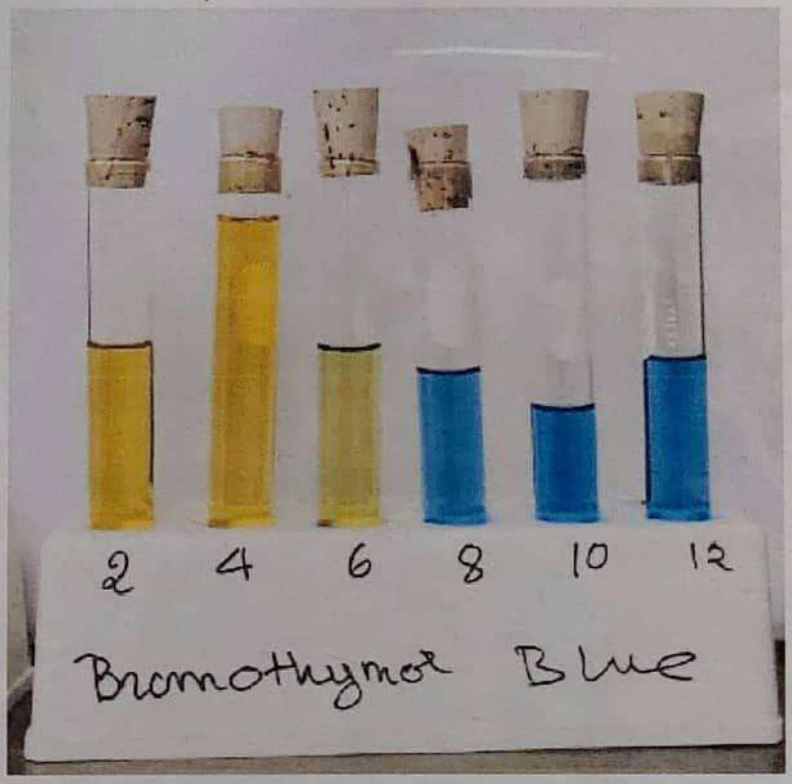
- The test is done by growing the organism on Glucose phosphate peptone water for 24hs at 37°C. 1ml of 40% potassium hydroxide and 3ml of 5% alpha-naphthol are added.

  - Negative test = light brown e.g. E. coli.
  - Positive test = pink color e.g. Klebsiella.



Sugar fermentation tests

- Fermentation with production of acid only: yellow color e.g. salmonella typhi.
- Fermentation with production of acid + gas: yellow color + gas bubbles in Durham's tube e.g. E. coli.

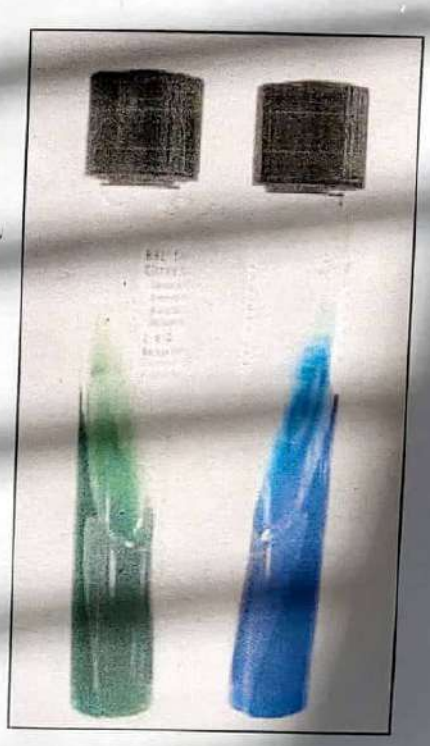


Citrate utilization test

- A test for the ability of an organism to utilize citrate as the sole source of carbon and energy, and ammonium salts as the sole source of nitrogen.

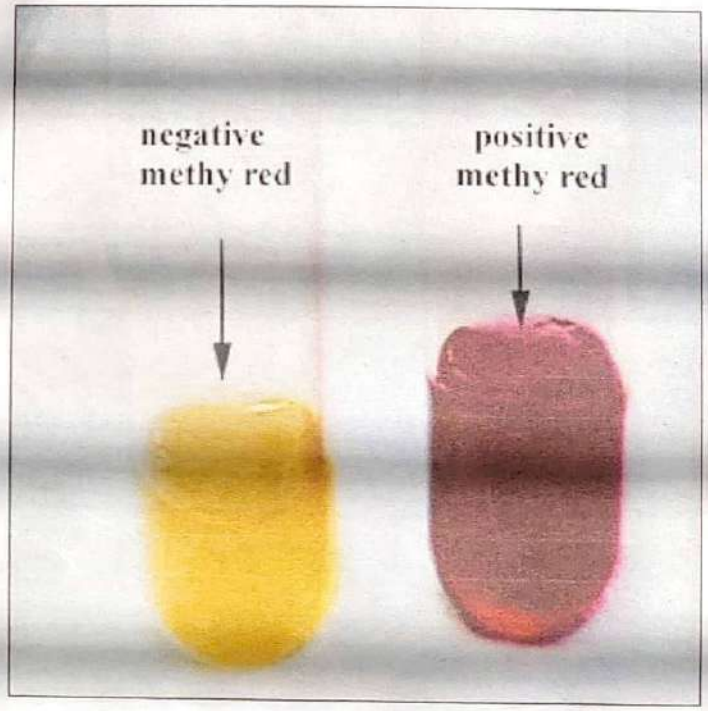
- Medium: Simmon's citrate agar medium containing sodium citrate and bromothymol blue as Ph indicator.

  - Negative citrate utilization = green color e.g. *E. coli*.
  - Positive citrate utilization = blue color e.g. *Klebsiella, Pseudomonas.*



Methyl red test

- Used to detect the production of sufficient acids during glucose fermentation.
- Medium: Glucose phosphate peptone water.
- The test is done by growing the organism on Glucose phosphate peptone water for 24hs at 37°C. few drops of methyl red indicator are added (red at acidic Ph).
  - Negative test = yellow e.g. Klebsiella.
  - Positive test = red e.g. E. coli.



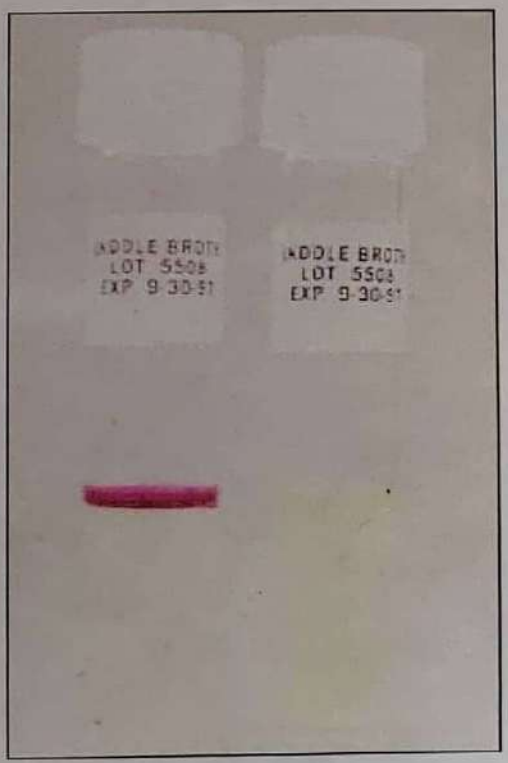
Indole production test

- A test for the ability of an organism to decompose the amino acid tryptophan to indole, which accumulates in the medium.

- Medium: Peptone water.

- The indole production is tested by growing the organism on peptone water for 24hs.any indole produced is extracted on the top of the medium . on addition of Erlich`s reagent, a pink ring is produced in positive cases.

  - Negative indole = e.g. *Klebsiella*
  - Positive indole = e.g. *E. coli*.



Urease test

- The ability of bacteria to decompose urea by means of the enzyme urease.

- Method: the test organism is cultured in a medium, which contains urea and phenol red (Ph indicator). If the organism is urease producing; the enzyme break down urea to give ammonia. With the release of ammonia the medium becomes alkaline and the phenol red change in color from yellow to pink.
  - Negative urease test = yellow color e.g. *E. coli.*
  - Positive urease test = pink color e.g. *Proteus.*