

IMViC Test

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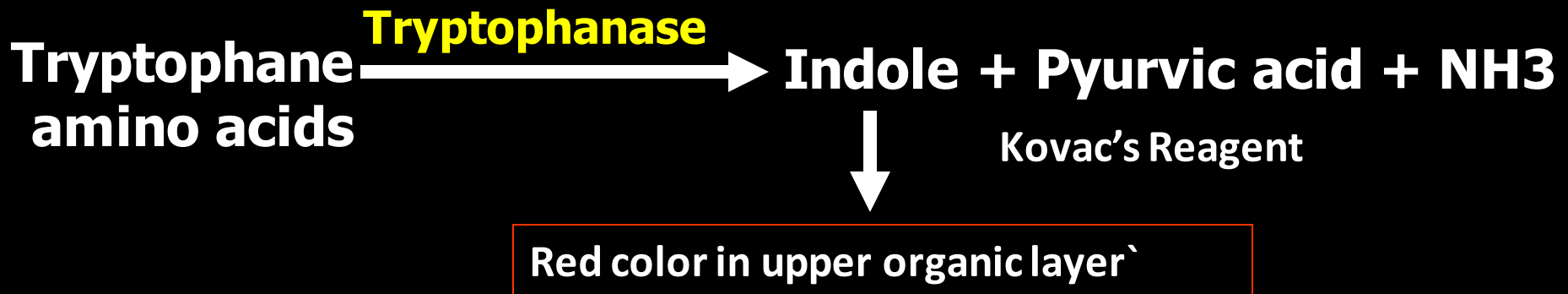
IMViC Test

- Indole, Methyl Red, Voges-Proskauer, Citrate (IMViC) Tests:
 - The following four tests comprise a series of important determinations that are collectively called the IMViC series of reactions
 - The IMViC series of reactions allows for the differentiation of the various members of *Enterobacteriaceae*.

IMViC: Indole test

■ Principle

- Certain microorganisms can metabolize tryptophan by tryptophanase
- The enzymatic degradation leads to the formation of pyruvic acid, indole and ammonia
- The presence of indole is detected by addition of Kovac's reagent.



IMViC: Indole test

❖ Method:

- Inoculate tryptone water with the tested microorganism
- Incubate at 37°C for 24 hours
- After incubation interval, add 1 ml Kovacs reagent, shake the tube gently and read immediately

IMViC: Indole test

❖ Result:

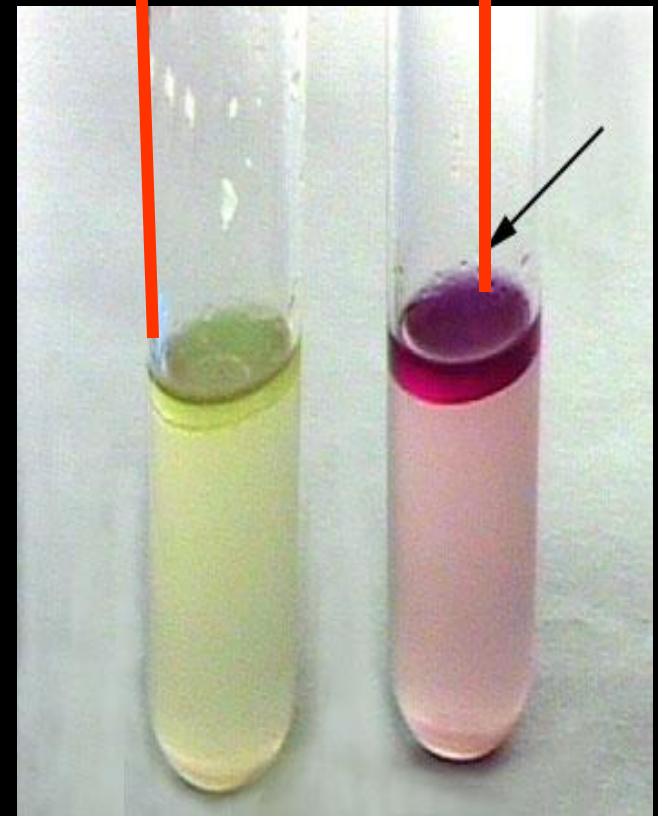
- A bright pink color in the top layer indicates the presence of indole
- The absence of color means that indole was not produced i.e. indole is negative

❖ Special Features:

- Used in the differentiation of genera and species. e.g. *E. coli* (+) from *Klebsiella* (-).

Negative test
e.g. *Klebsiella*

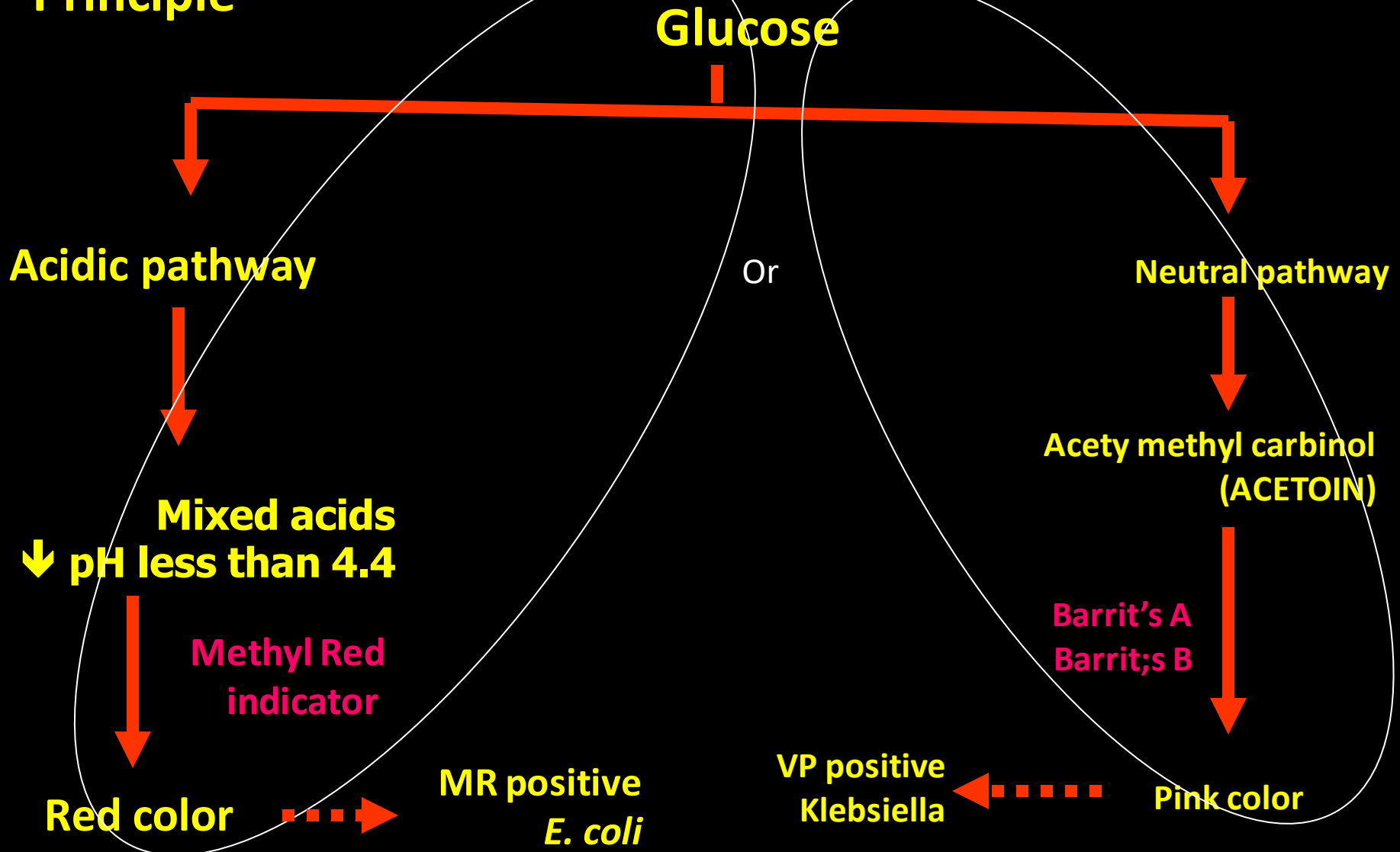
Positive test
e.g. *E. coli*



IMViC test

Methyl Red-Voges Proskauer (MR-VP) Tests

Principle



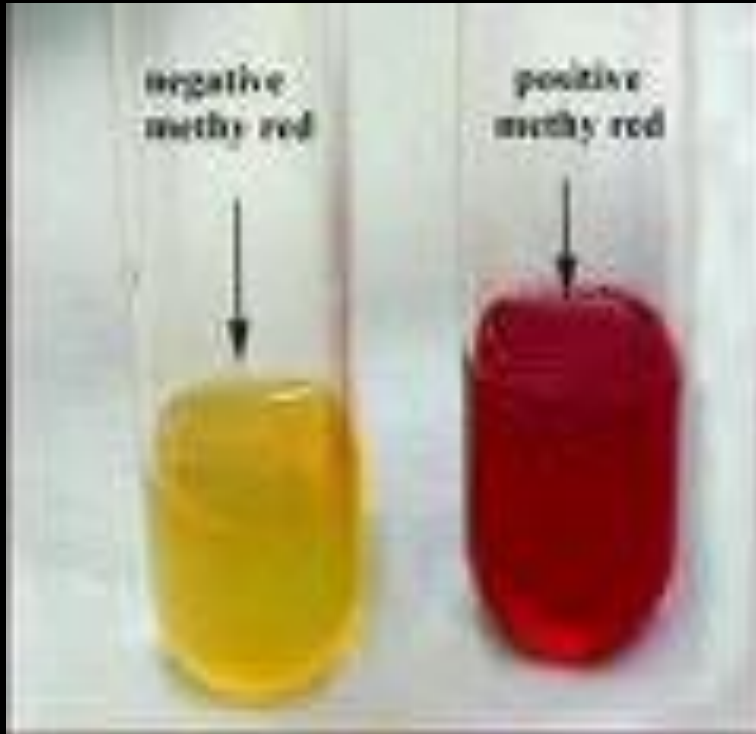
IMViC test: MRVP test

❖ Method

- Inoculate the tested organism into One tube of [MRVP](#) broth
- Incubate the tubes at 37°C for 24 hours
- AFTER INCUBATION: Pour 1/3 of the suspension into a clean nonsterile tube:
- Run the MR test in the tube with 2/3, and the VP test in the open tube with 1/3.
 - For methyl red: Add 6-8 drops of methyl red reagent.
 - For Voges-Proskauer: Add 12 drops of Barritt's A (α -naphthol), mix, 4 drops of Barritt's B (40% KOH), mix
 - Let sit, undisturbed, for at least 1 hour

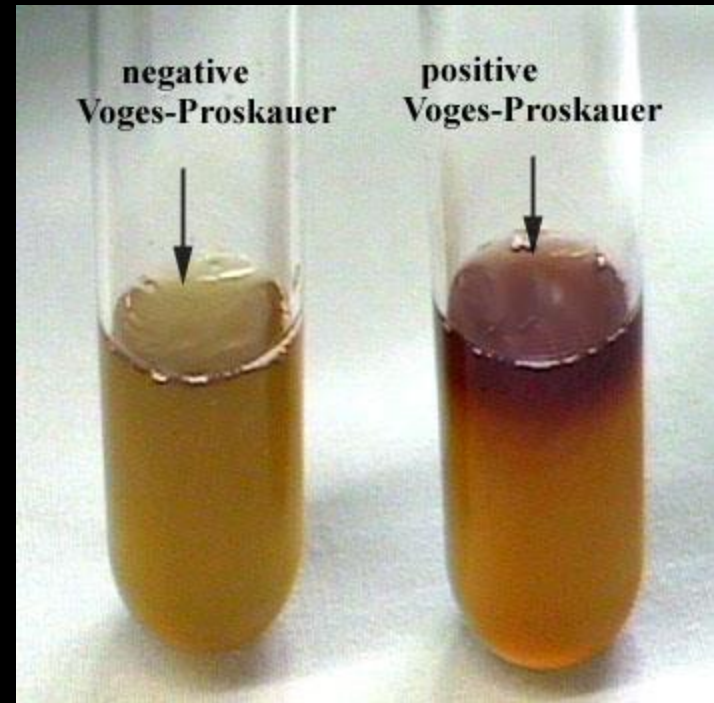
IMViC test: MR/VP test

❖ Results



Methyl Red test

- ✓ Red: Positive MR (*E. coli*)
- ✓ Yellow or orange: Negative MR (*Klebsiella*)

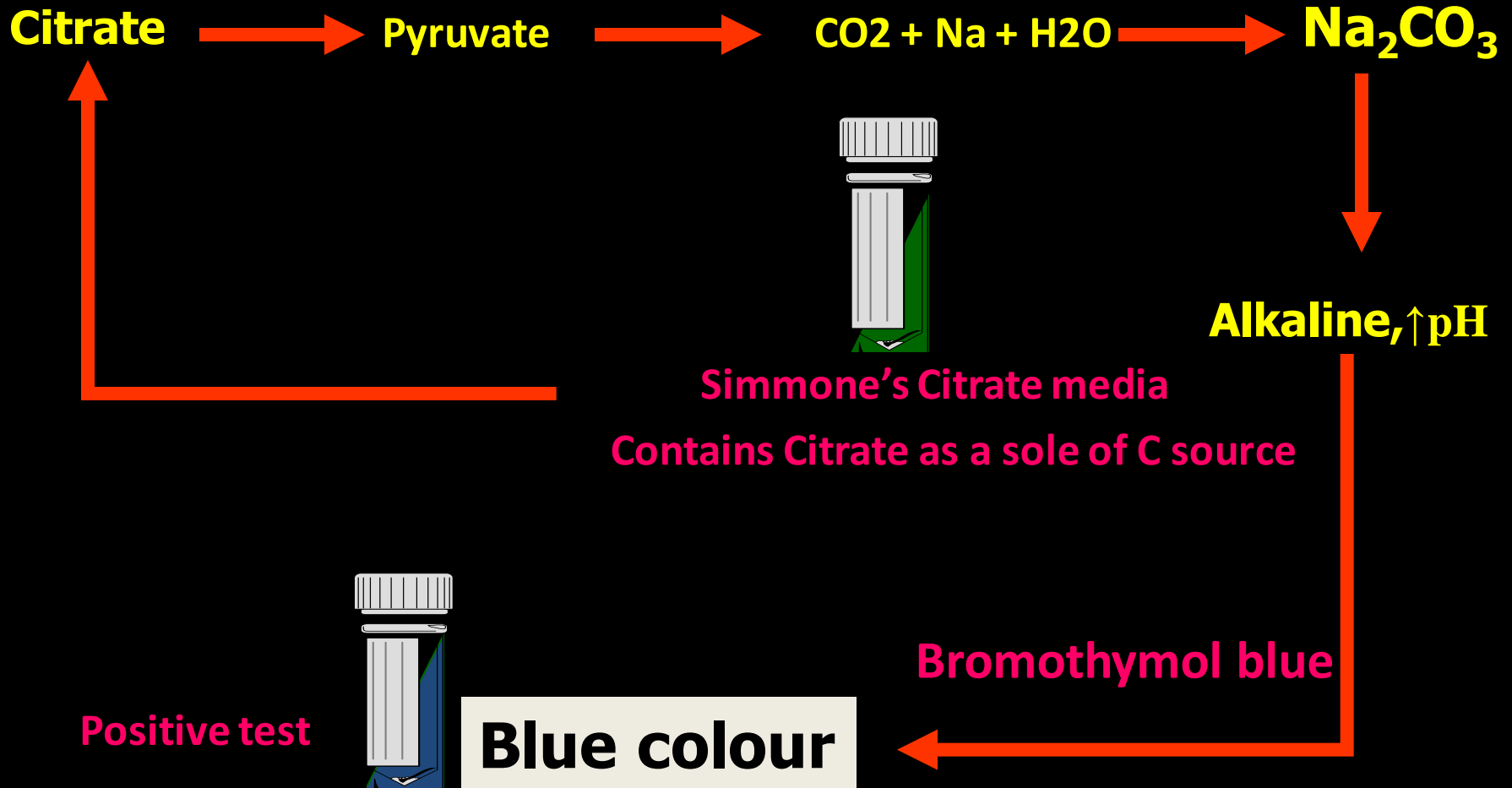


Voges-Proskauer test

- ✓ Pink: Positive VP (*Klebsiella*)
- ✓ No pink: Negative VP (*E. coli*)

Citrate Utilization Test

Principle:



➤ Positive test: *Klebsiella*, *Enterobacter*, *Citrobacter*

➤ Negative test: *E. coli*

Citrate Utilization Test

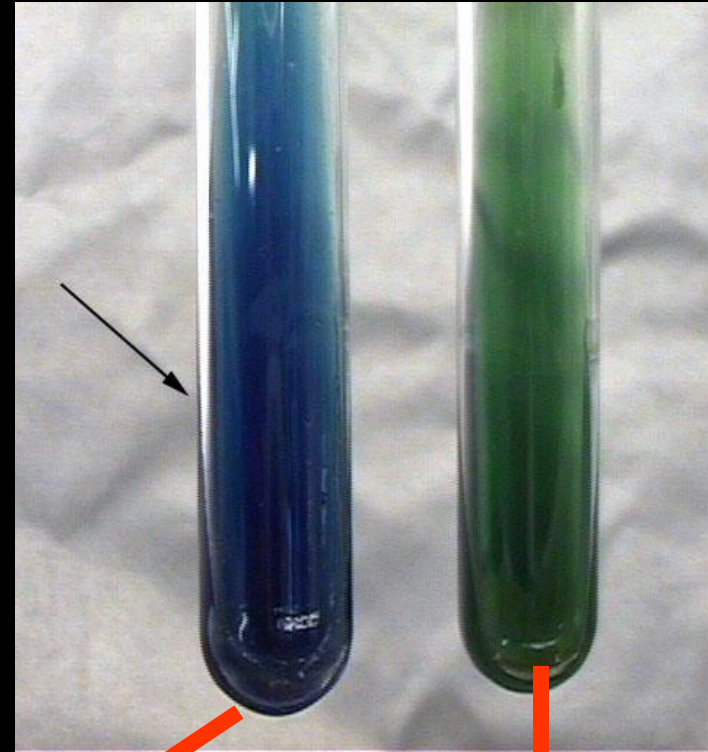
❖ Method

- Streak a Simmon's Citrate agar slant with the organism
- Incubate at 37°C for 24 hours.

Citrate Utilization Test

❖ Result

- Examine for growth (+)
- Growth on the medium is accompanied by a rise in pH to change the medium from its initial green color to deep blue



Positive
Klebsiella, Enterobacter

Negative
E. coli