

NAME _____

DATE _____

Carolina LabSheets™
Bacteria: The Citrate Test

To grow, bacteria require carbon. Many bacteria types obtain carbon by metabolizing carbohydrates. However, some bacteria can use citrate as their only source of carbon. This requires citrate transport proteins to move the citrate from the growth medium to the interior of the cell. Metabolism of the citrate ultimately produces alkaline carbonates and bicarbonates, which are secreted into the medium. Simmons Citrate Agar contains sodium citrate, and no other carbon source. It also includes bromthymol blue, a pH indicator that is green at neutral pH but becomes dark blue as pH rises slightly above neutral.

Inoculating Tubes

1. Flame your inoculating loop.
2. Remove the cap from a bacterial culture tube, flame the mouth, and use your loop to remove a small amount of culture.
3. Flame the mouth of the tube and replace the cap.
4. Remove the cap from a tube of Simmons Citrate Agar. Flame the mouth of the tube and use your loop to streak the surface of the agar, beginning at the lower end of the slant and moving toward the top.
5. Flame the mouth of the tube and replace the cap.
6. Flame your inoculating loop.
7. Mark the Simmons Citrate tube with your initials, the current date, and the name of the bacteria you inoculated it with.
8. Incubate the tube as directed by your instructor.
9. Repeat this process for the second bacterial culture.

Observing and Recording Results

What would a color change of the medium from green to blue indicate?

What inference can you draw from this color change?

Describe the initial and final appearance of the Simmons Citrate Agar, in terms of color and observed growth (if any), for each bacteria.

Citrobacter freundii

Initial color: _____

Final color: _____

Escherichia coli

Initial color: _____

Final color: _____

According to your results, which, if either of the bacteria is able to use citrate as its sole carbon source?

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