



Simmons Citrate Agar

RDM-SCA-01

Principle

Simmons Citrate Agar is a modification of Koser's medium (1923). Simmons citrate agar is composed of magnesium sulphate, ammonium dihydrogen phosphate, dipotassium phosphate, sodium citrate, sodium chloride, bromothymol blue and agar. Magnesium sulfate is a cofactor for variety of metabolic reactions for growth and reproduction of microorganisms. Ammonium dihydrogen phosphate is the source of nitrogen. Dipotassium Phosphate acts as a buffer. Sodium Citrate is source of carbon. Sodium Chloride maintains the osmotic balance. Bromothymol blue act as pH indicator. Agar is solidifying agent. The microorganisms have ability to utilize citrate as a source of energy and capable of utilizing ammonium dihydrogen phosphate will grow on this medium. The citrate metabolizing microbes accumulate alkaline by products by synthesizing citrate permease, which convert citrate to pyruvate. The synthesized pyruvate is used by the organisms in metabolic cycle for energy production. The citrate metabolizing bacteria, break down the ammonium slats into the ammonia, result rise in alkalinity of the medium. The shift in pH turns the bromthymol blue indicator in the medium from green to blue above pH 7.6

Use: Recommended for differentiation the members of *Enterobacteriaceae* on the basis of citrate utilization from clinical and non-clinical samples.

Contents*

Ingredients

	Gram/Litre
Magnesium Sulphate	0.200
Ammonium Dihydrogen Phosphate	1.000
Dipotassium Phosphate	1.000
Sodium Citrate	2.000
Sodium Chloride	5.000
Bromothymol Blue	0.080
Agar	15.000
pH at 25°C	6.8 ±0.2

* Formula adjusted for optimum performance and parameters

Directions: Dissolve 24.28 grams in 1000 ml distilled water (the pH of distilled water must be 6.5 to 7.0). Boil to dissolve the medium completely and sterilize by autoclaving at 15 lbs. pressure (121°C) for 15 min, cool it to 42-45 °C and distribute aseptically in test tubes. Slant the tubes to have a small butt and slant, allow to solidify. Ensure complete solidification and inoculate test sample aseptically.

Specimens types analyzed

Pharmaceutical samples, clinical and non-clinical samples etc.

Precautions to be taken

These microbial media are intended for the in-vitro use only. All the handling, experiments, storage, and discarding should be performed with the help of skilled and knowledgeable technicians and as per the established guidelines. The material should be disposed only after proper sterilization by autoclaving. Please go through the MSDS of the media to avoid any accidents or in emergency.

Performance and Evaluation

The expected performance of the medium is liable to use as per the direction on the label when stored at optimum conditions and within expiry date.

Quality Control

Appearance	Light yellow colored free flowing, homogeneous powder
Reaction of 2.42% solution	6.8 ±0.2 at 25 °C
pH	6.60- 7.00
Gelling	Firm comparable with 1.5% agar gel
Color and clarity of ready medium	Forest green colored, slightly opalescent gel
Growth Promotion properties	Best at ≤ 100 CFU at 32-37 °C for 18-72 h
Indicative properties	Optimum at ≤ 100 CFU at 32-37 °C for 18-48 h
Negative control	Performed using sterile distilled water

Different Microbial Response

Organism	Inoculum	Growth	Color of medium around the colonies	Citrate utilization
<i>Escherichia coli</i> (ATCC 25922)	50-100	Poor	No color change due to growth inhibition	Negative
<i>Salmonella typhimurium</i> (ATCC 14028)	50-100	Good	Blue color formed	Positive

Storage and Shelf Life

Hygroscopic; keep container tightly closed. Store in cool dry place.

Disposal: To avoid the contamination or propagation of any hazardous microbes the used, unusable or modified preparation of this product must be disposed after autoclaving after completion of task.

Reference

1. Atlas, R. M. (2005). *Handbook of media for environmental microbiology*. CRC press.
2. *Difco Manual* (1998). 11th Edition. Difco Laboratories., Division of Becton Dickinson and Company, Sparks, Maryland, USA.
3. MacFaddin J., (1985), *Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria*, Vol. 1, Williams and Wilkins, Baltimore.

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