



Product Sheet

# *Methanosarcina barkeri* (ATCC® 43569™)

Please read this FIRST



Storage Temp.  
**Frozen: -80°C or colder**  
**Freeze-Dried: 2°C to 8°C**  
**Live Culture: See Propagation Section**

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Biosafety Level  
**1**

## Intended Use

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

## Citation of Strain

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: *Methanosarcina barkeri* (ATCC® 43569™)

American Type Culture Collection  
PO Box 1549  
Manassas, VA 20108 USA  
[www.atcc.org](http://www.atcc.org)

800.638.6597 or 703.365.2700  
Fax: 703.365.2750  
Email: [Tech@atcc.org](mailto:Tech@atcc.org)

Or contact your local distributor

## Description

**Designation:** [ATCC 51582, DSM 800, MS, OCM 38]  
**Deposited Name:** *Methanosarcina barkeri* Schnell  
**Product Description:** Type strain

## Propagation

### Medium

ATCC® Medium 2889: SAB Broth

### Growth Conditions

**Temperature:** 37°C

**Atmosphere:** Anaerobic gas mixture, 80% H<sub>2</sub>-20% CO<sub>2</sub>

### Propagation Procedure

1. Pre-reduce media in the following manner: Add trimethylamine to a final concentration of 20 mM. Exchange gas in the headspace of the Baltch tube of media with 80% H<sub>2</sub>-20% CO<sub>2</sub> gas at 5 psi. The medium must be colorless before inoculating. If a hint of resazurin is noticeable (see note below), add 0.1 mL reducing agent.
2. Open thawed vial according to enclosed instructions or visit [www.atcc.org](http://www.atcc.org) for instructions.
3. Under anaerobic conditions aseptically transfer the entire contents to a 5-6 mL Baltch tube of #2889 broth. Additional test tubes can be inoculated by transferring 0.5 mL of the primary broth tube to these secondary broth tubes. Best practice dictates the use of pre-reduced media.
4. Incubate in an anaerobic atmosphere at 37°C for 7 days. Incubate one agar plate aerobically at 37°C to check for contamination.

### ANAEROBIC CONDITIONS:

- a. Resazurin is a commonly used redox indicator that is pink when the redox potential is above 50 mv., and colorless when the redox potential is below 110 mv. i.e. highly reducing. Most strict anaerobes require this low redox potential for optimum growth.
- b. To obtain a fully reduced medium, it is necessary that the medium be anoxic and that a reducing agent be added. Common reducing agents are sodium sulfide, cysteine, dithiothreitol, and titanium citrate.
- c. Syringes can be made anaerobic by one of two methods.
  1. Displace the dead space in the syringe with a sterile oxygen-free gas.
  2. Displace the dead space in the syringe with a reducing agent.

Anaerobic conditions for incubation may be obtained by any of the following:

- Loose screw caps on test tubes in an anaerobic chamber
- Loose screw caps on test tubes in an activated anaerobic gas pack jar
- Use of sterile butyl rubber stoppers on test tubes so that an anaerobic gas headspace is retained

## Notes

This organism requires the addition of 20 mM trimethylamine to the broth for best growth. Culture may have to be established in the primary broth before subcultures can be made.

### Reducing agents:

We suggest adding the reducing agent to the medium at least one hour before the medium is to be inoculated. Co-enzyme M (mercaptoethanesulfonic acid) (100 X solution): *Dissolve 5.0 g in 100 mL of deionized water. Distribute into screw cap test tubes, 5–6 mL per tube and seal with rubber stoppers under N<sub>2</sub> gas. Autoclave to sterilize. Excess tubes can be stored at room temperature for up to 2 months. Co-enzyme M is a compound produced by many methanogens. Some methanogens are sensitive to stronger reducing agents such as sodium sulfide. Co-enzyme M is the standard reducing agent we use when working with methanogens.*

Sodium sulfide (100 X solution): *Dissolve 1.5 g in 100 mL of distilled water. Distribute into screw cap test tubes, 5–6 mL per tube, and seal with Hungate stoppers. Autoclave to sterilize. Excess tubes can be stored frozen for up to 6 months. Once thawed a tube of sodium sulfide should not be used for more than a week. CAUTION: if sodium sulfide comes into contact with a strong acid, hydrogen sulfide (H<sub>2</sub>S), a very toxic gas, is liberated immediately.*

Cysteine (100X solution): *Dissolve 3.0 g in 100 mL of distilled water. Distribute into screw cap test tubes, 5–6 mL per tube, and seal with Hungate stoppers. Autoclave to sterilize. Excess tubes can be stored frozen*



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for up to 6 months. Once thawed, a tube of cysteine should not be used for more than a week.

## Substrates: Useful Information:

Some methanogens are able to utilize substrates other than H<sub>2</sub>-CO<sub>2</sub>, such as acetate, propionate, methanol, etc. These substrates can be added directly to the tubed medium, making it possible to use the same medium for more than one organism. We suggest making up anaerobic stock solutions at 100X. Some of these substrates (organic acids) need to be neutralized with sodium hydroxide.

Amount per 100 mL for 1M solution:

- Acetic acid: 5.7 mL
- Propionic acid: 7.5 mL
- Butyric acid: 9.2 mL
- Formic acid (tech, 90%): 4.2 mL
- Methanol (100%): 4.0 mL

## WARNING: EXPLOSION HAZARD:

Methanogens that grow on methanol produce methane gas resulting in over pressurization of growth vessels (3). This creates a potential explosion hazard. We recommend growing cultures in pressure-resistant Balch tubes\* to reduce this risk. The cultures should be vented regularly to reduce the gas and prevent overpressure. If it is necessary to grow larger batches of methanol-utilizing methanogens in sealed serum vials, extra caution should be taken. Typically, 3 moles of methane are produced from one mole of methanol. Always wear protective eye wear when working with methanogens growing in tubes or bottles.

Additional information on this culture is available on the ATCC® web site at [www.atcc.org](http://www.atcc.org).

## References

References and other information relating to this product are available online at [www.atcc.org](http://www.atcc.org).

## Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the current publication of the *Biosafety in Microbiological and Biomedical Laboratories* from the U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes for Health.

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## Disclaimers

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Additional information on this culture is available on the ATCC web site at [www.atcc.org](http://www.atcc.org).  
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