

Difference Between Solid and Liquid Media

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Key Difference – Solid vs Liquid Media

Microorganisms are cultivated and maintained in microbiological laboratories for various purposes. Growth requirements of the microorganisms are fulfilled by means of a growing medium, in order to obtain a sufficient growth. A growth medium or a culture medium is defined as the solid or liquid formulation which contains the nutrients and other necessary materials to support the growth of microorganisms and cells. Growth media can be either solid or liquid preparations. Solid media are designed with a solidifying agent. Liquid media lack a solidifying agent. [Agar](#) is used as the solidification agent in growth media. The key difference between solid and liquid media is that **solid media contain agar** while **liquid media do not contain agar**.

What are Solid Media?

Growth media are designed according to the growth requirements of the microorganisms and the purpose of growing microbes on media. Culture media contain necessary nutrients the other ingredients required for microorganisms. Various types of culture media are available. Most culture media are prepared as solid formulations by adding a solidification agent (agar) generally at the concentration of 1.5%. Agar is a jelly-like substance which is used to solidify the medium. It is an inert substance which does not have a nutritional value. Agar is extracted from several species of [red algae](#). The commercial agar is derived mainly from *Gelidium* red algae. Solid medium is a mixture of agar and other nutrients. When agar is added, the medium becomes solid at room temperature.

Solid media are generally poured into petri dishes to prepare agar plates. An agar plate provides a good surface and space to [aerobic](#) microorganisms, especially [bacteria and fungi](#), to grow well. These agar plates with microorganisms can be used to study their characteristics. Microbes which are supposed to be used for staining techniques are grown in solid media on plates. Morphological characteristics can also be observed from the microorganisms grown on agar plates. Solid media are also used to prepare agar slants to grow microorganisms for the storage purposes.

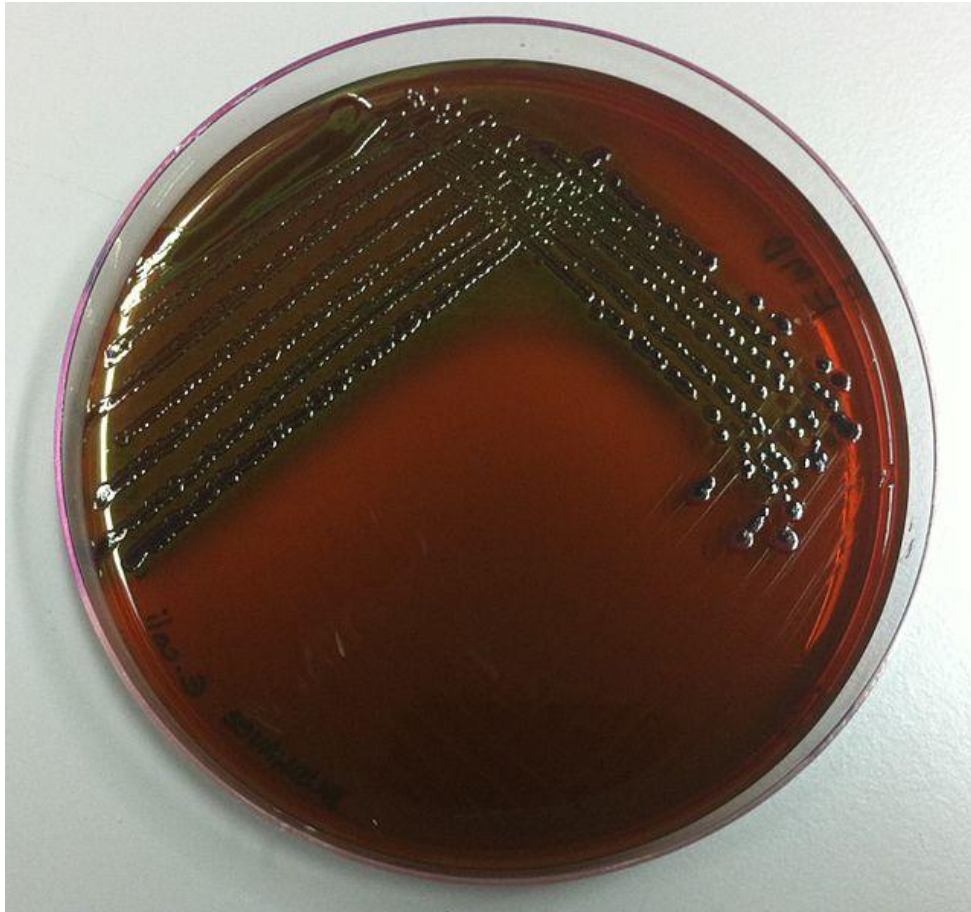


Figure 01: Solid Media

What are Liquid Media?

Liquid media are a type of culture media used to cultivate and maintain microorganisms. They are also referred to as culture [broths](#). Liquid media are not supplemented with a solidifying agent. Hence, these media remain as liquids even at room temperature. Liquid media are generally poured into test tubes or culture bottles.

When bacteria are grown in broth tubes, they are separated according to the oxygen requirement. Hence, bacteria grown on broth tubes are used to differentiate bacteria based on their oxygen requirement. Bacteria which need oxygen (strict [aerobes](#)) will grow near the surface of the broth medium while bacteria which are toxic to oxygen (strict [anaerobes](#)) will grow at the bottom of the broth tube. Bacteria that can live in presence as well as in the absence of oxygen are known as facultative anaerobes, and they are found mostly at the top of the tube. Microaerophilic bacteria are found in the upper part of the broth tube, but not at the top. Aerotolerant bacteria are normally grown evenly throughout the broth tube.

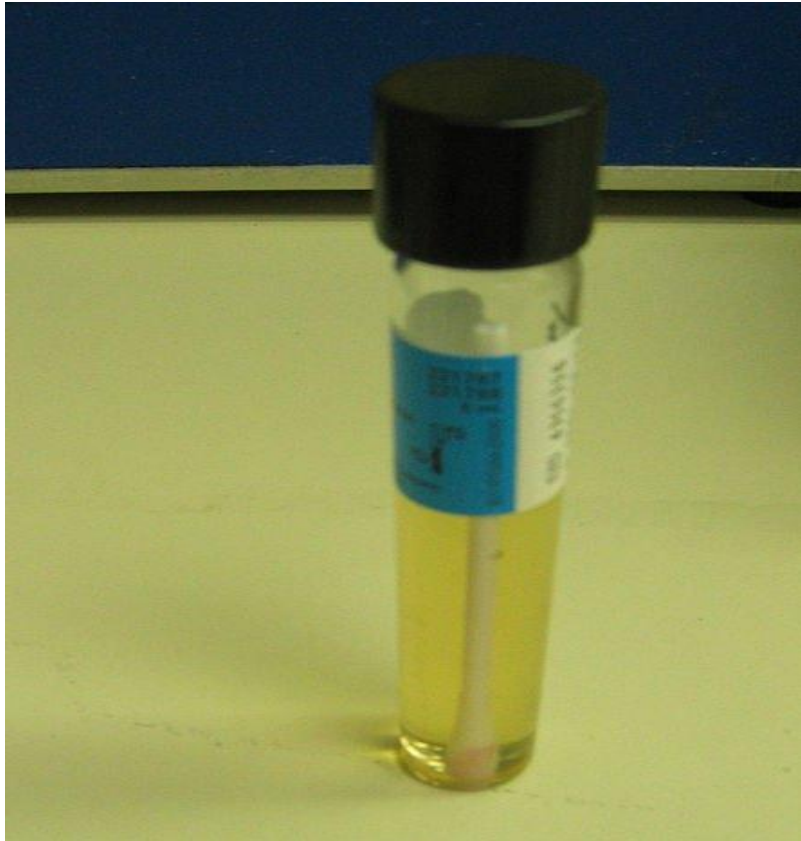


Figure 02: Liquid media

What is the difference between Solid and Liquid Media?

Solid vs Liquid Media

Solid media are a type of culture media used to cultivate microorganisms.

Liquid media are a type of culture media used to cultivate microorganisms.

Presence of Agar

Solid media contain agar.

Liquid media do not contain agar.

Petri Dishes

Solid media are poured into petri dishes.

Liquid media are not poured into petri dishes.

Uses

Solid media are used for isolating bacteria or for determining the colony characteristics of the microorganisms.

Liquid media are used for various purposes such as propagation of a large number of organisms, fermentation studies, and various other tests.

Eg. sugar fermentation tests, MR-VR broth

Summary – Solid vs Liquid Media

Solid and liquid media are two types of commonly used culture media. Solid medium is prepared by adding a solidifying substance. Commonly used solidifying agents are gelatin or agar. Liquid media are not provided with a solidifying agent. Both solid and liquid media contain nutrients and other necessary substances to support the growth of microorganisms. The main difference between solid and liquid media is the presence or absence of agar or a solidifying agent.

References:

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Image Courtesy:

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APA: Difference Between Solid and Liquid Media. (2017, June 25). Retrieved (date), from <http://www.differencebetween.com/difference-between-solid-and-vs-liquid-media/>

MLA: "Difference Between Solid and Liquid Media." Difference Between.Com. 25 June 2017. Web.

Chicago: "Difference Between Solid and Liquid Media." Difference Between.Com. <http://www.differencebetween.com/difference-between-solid-and-vs-liquid-media/> (accessed [date]).



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