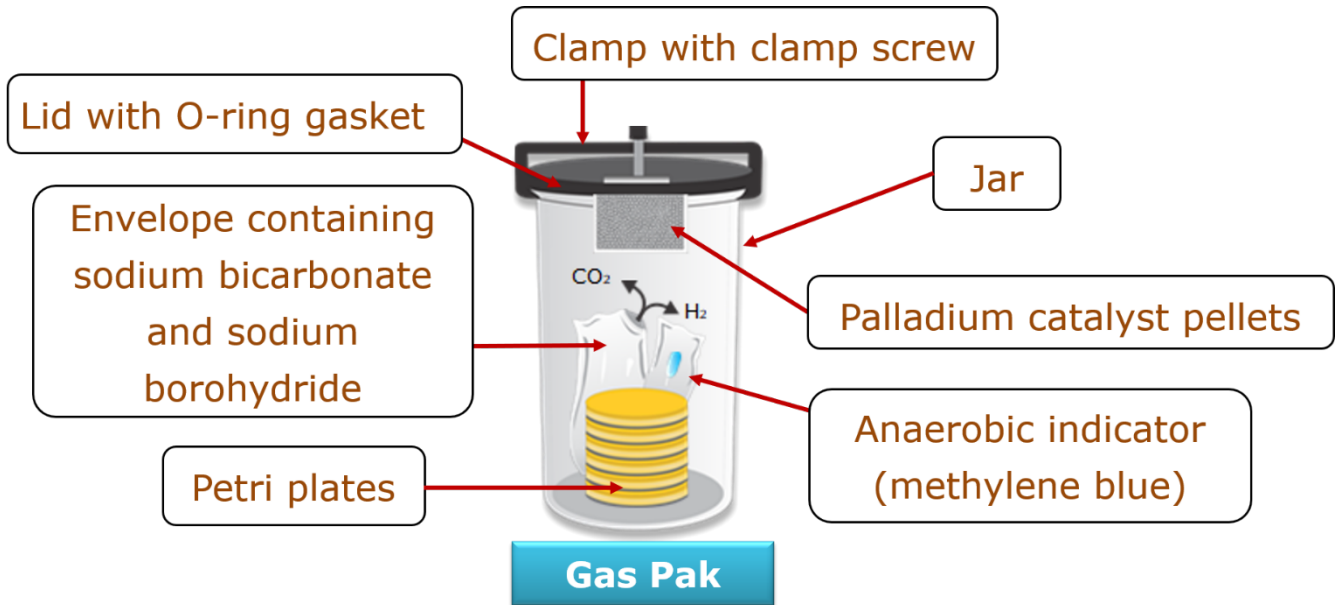


Anaerobic Cultivation

- Different physical parameters are required for growth of micro-organisms.
- One such parameter is availability of oxygen in the environment.
- During the course of evolution, bacteria in different habitats adjusted and evolved to utilize atmospherically available gases for respiration.
- The capacity of utilizing different gases for respiration depends on the terminal electron acceptor in the Electron Transport Chain (ETC), the organisms are categorised as aerobes and anaerobes.
- In addition to this, the sub-categories of the microbes like facultative anaerobe, microaerophiles etc. depend on the availability of the enzymes: Superoxide dismutase and catalase.
- Superoxide dismutase and catalase are the enzymes that rescue the cells from harmful products of the aerobic respiration.
- Metabolic reactions happening within each type of cells are explained in the modules.
- Absence of these enzymes makes the cells unfit for the growth in oxic conditions.
- In order grow organisms requiring anoxic environments, special growth conditions should be made available.
- The anoxic conditions can be made available by stabbing culture in a solid medium, providing reducing agents like thioglycolate in liquid medium or by using anaerobic GasPack jars.
- The gas packs jars are specialized instruments made for incubation purpose.
- The jar is separated from the other environment by having a lid with a rubber gasket seal. Inside, there are palladium pellets that catalyse the reaction of removing water by combining oxygen and water.
- In addition to this, there is an indicator stripe for indicating anoxic conditions. Methylene blue is the indicator used. It turns colourless in the absence of oxygen.

- The culturing of the anaerobes should be done in specialized chambers having an arrangement for putting in hands and has provision of CO₂.



References:

Willey, J. M., Sherwood, L., & Woolverton, C. J. (2002). Prescott's Microbiology (Vol. 5). New York: McGraw-Hill.

Pelczar, Michael Joseph, and Roger Delbert Reid. Microbiology. Krishna Prakashan Media, 1958.

Brock, T. D., Madigan, M. T., Martinko, J. M., & Parker, J. (2003). Brock biology of microorganisms. Upper Saddle River (NJ): Prentice-Hall, 2003.