Indian Institute of Technology Delhi
Department of Biochemical Engineering and Biotechnology

I SEMESTER
BBL132 – GENERAL MICROBIOLOGY LABORATORY

EXPERIMENT # 7

AIM

To study the influence of different environmental factors (pH and temperature) on microbial growth.

BACKGROUND

The total environment must be sustained to achieve the desired growth of microorganisms. Factors such as temperature, hydrogen ion concentration of the organism's environment exerts the greatest influence on its growth. Microorganisms need optimum temperature and pH for their growth. If the pH and temperature are varied, then a marked effect on the growth can be observed. However, the optimum temperature varies from one organism top another. Some prefer neutral pH while others grow best under alkaline or acidic conditions because at their optimum temperature/pH, their enzymatic reactions proceed at maximum rates. The rates of reactions can slow down considerably or stop if the pH/temperature varies to a great extent.

PROCEDURE

(A). To study effect of temperature:

1) Inoculate four tubes of 10 ml nutrient broth with 100 µl of given freshly grown microbial culture broth.
2) Incubate the tubes at different temperatures such as 4°C, 30°C, 37°C and 45°C for 24 h.
3) Read the optical density at 610 nm against medium as blank.
4) Plot optical density vs time at different temperatures and determine the optimum temperature for growth of the given microorganism.

(B). To study effect of pH:

1) Prepare five tubes of 10 ml nutrient broth and adjust the pH to 5, 6, 7, 8 and 9 separately.
2) Inoculate four tubes of 10 ml nutrient broth with 100 µl of given freshly grown microbial culture broth and incubate at 30°C for 24h.
3) Read the optical density at 610 nm against medium as blank.
4) Plot optical density vs pH at different pH and determine the optimum pH for growth of the given microorganism.