

EXPERIMENT V – CELL IMMOBILIZATION

Immobilized cells have some advantages compared to free cells, such as being easily separated from the product, being used again and again, achieving high volumetric efficiency values, easier process control, and less susceptibility to contamination. In addition to being more stable and cheaper, there is no need for enzyme separation and purification processes, in many cases, immobilized cells are preferred to immobilized enzymes. The most used polymer immobilization technique is the arrest method in polymer matrix. In this method, gelatine, agar, alginate, carrageenan, collagen, polyacrylamide cellulose and its derivatives are used.

Immobilization materials

Acrylamide

N,N-methylene bisacrylamide (BIS)

TEMED

Ammonium persulfate

Method

- a) Weigh: 750 mg Acrylamide and 40 mg N,N- methylene bisacrylamide
- b) Prepare stock solution (100mg/1 ml). For 1% Ammonium persulfate, take 0.5 mL from the stock.
- c) Preparation of cell suspension

Yeast will be used in the experiment as live cells source.

- a- Dilute 1 g fresh yeast in 2 ml of 0.9% NaCl.
- b- Add acrylamide and bisacrylamide, which you have weighed above, into this solution and mix with a vortex mixer.
- c- Arrest process: Add 0.5 ml of cross-linking 1% ammonium persulfate to the cell-containing acrylamide-bisacrylamide solution and add TEMED as the polymerizing initiator.
- d- Wait for the polymerization to complete. After polymerization, wash the gel thoroughly with 0.9% salt solution and dry the gel. Then cut the gel into small pieces with a sharp knife. Separate and weigh a piece of gel, add some starch to the medium and use the glucose assay kit to detect the glucose released by the yeast.

1- Why TEMED was added to the solution?

2- Why is starch added to the solution?