

Experiment 04: PREPARATION OF A HYDROALCOHOLIC GEL

I. Introduction:

A gel is a system that primarily contains liquid but resists flow. It exhibits all the properties of liquids (molecular mobility, interactions with solids or liquids, dissolution or precipitation, ionization, chemical or biochemical reactions) except one: the ability to flow under the influence of forces as weak as desired. Gels are generally hydrophilic in nature and are most often intended for application on the skin and mucous membranes. Hydroalcoholic gels are antiseptic solutions for the skin. They are used to ensure hand hygiene, particularly during medical care. They act through direct and mechanical contact (by friction) and



II. Objective of experiment:

Preparation of a hydroalcoholic gel.

III. Reagents:

- Ethanol 96°: 60 g.
- Carbopol (carbomer 990): 0,5 g.
- Triethanolamine to adjust pH.
- Glycerol: 2 g.
- Hydrogen Peroxide (3-12% solution): 4 g.
- Distilled Water: q.s.p to 100 g.

IV. Experimental Procedure :

- In a beaker of 250 mL, disperse the carbopol in a mixture of 30 g of water and 60 g of ethanol under strong homogenization.
- Reduce the homogenization and continue homogenizing until the foam is completely dissipated.
- Measure the pH of the carbopol dispersion.
- Add 10 drops of the triethanolamine solution, glycerol, and hydrogen peroxide. Continue homogenization at a low speed for 5 minutes.
- Stop homogenization and add the triethanolamine solution drop by drop under very low agitation until the mixture gels. Count the number of drops added.
- Complete to 100 g with distilled water, taking into account the amount of triethanolamine solution added.
- Store the solution for 72 hours before use to ensure optimal antimicrobial effectiveness and stability.

V. Questions:

- 1- What is the purpose of each ingredient in the hydroalcoholic gel formulation?
- 2- How does the pH of the carbopol dispersion affect the final gel's properties?
- 3- How does the homogenization speed impact the texture and consistency of the gel?
- 4- What is the role of triethanolamine in the preparation?
- 5- What safety precautions should be taken when handling triethanolamine during preparation?
- 6- What is the final volume of the gel after adding distilled water?
- 7- What role does glycerol play in the formulation of hydroalcoholic gel?