

were left in the air until the formation of bubbler ceased, then transferred into an ethanol–water mixture to perform solvent exchange and thus producing alcogels.

Alcogels were packed into filtered paper parcels, placed on the preheated autoclave (313 K), and covered by ethanol to prevent premature solvent evaporation from the gel. Supercritical drying was performed using the same autoclave as for gelation. The autoclave was sealed and filled with CO₂ by a membrane pump. The system was depressurized in 1 hour followed by cooling down to room temperature resulting in the formulation of alginate aerogels [56].

4.4 Future Perspectives

Alginates as a biomaterial for clinical use have been established, although they are not free from issues. Alginate-based 3D cell culture systems are important in cellular physiological investigation, drug delivery evaluation, and tissue engineering. The 3D culture system; macroporous structures have the ability to reflect native extracellular metrics and natural physiological environment.

Cell-based microparticles are undergoing advanced research in the progress of cell transplantation therapy of diabetes and neurodegenerative disease treatment using alginate. Alginate oligosaccharides of low molecular polymer fragment formed by enzymatic depolymerization or high temperature acid hydrolysis is used as a drug vehicle.

References

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