ACADEMICIA: An International Multidisciplinary Research Journal
ISSN: 2249-7137 Vol. 11, Issue 11, November 2021 SJIF 2021 = 7.492
A peer reviewed journal

REVIEW ON PREPARATION, CHARACTERIZATION AND APPLICATIONS OF HYDROGEL

Dr. Megha sharma*

* Faculty of Engineering, Teerthanker Mahaveer University,
Moradabad, Uttar Pradesh, INDIA
Email id: drmegha.computers@tmu.ac.in
DOI: 10.5958/2249-7137.2021.02491.5

ABSTRACT

Hydrogel products are a class of polymeric materials with a hydrophilic structure that allows them to retain enormous quantities of water in three-dimensional networks. The widespread use of these goods in a range of manufacturing and environmental applications is seen as critical. Natural microgels were progressively phased out in favor of synthetic biomaterials, which have a greater water absorption capacity, a longer service life, and a wider range of basic chemical resources. The literature on this topic is growing, particularly in scientific fields of study. Nevertheless, a number of papers and technical studies working with gel s from an engineering perspective were reviewed in order to get a broad overview of the technological elements of this rapidly expanding interdisciplinary area of study. The main goal of this paper is to examine the literature on hydrogel categorization on several grounds, physical and chemical properties of these products, and technological feasibility of their use. It also included the technologies used in hydrogel manufacturing, as well as process development considerations, block diagrams, and optimum preparation conditions. In addition, a newly developed category of prior decades of methods for generating was described in considerable depth.

KEYWORDS: *Applications, Hydrogel, Innovative, Preparation, Processing.*

REFERENCES

1. Hu Y, Yu X, Dan W, Yin T, You J, Xiong S. Preparation, characterization and biomedical applications of collagen based hydrogels. Gongneng Cailiao/Journal of Functional Materials. 2017, doi: 10.3969/j.issn.1001-9731.2017.01.006.
2. Devi A, Nautiyal U, Kaur S, Komal K. Hydrogels: a smart drug delivery device. Asian Pacific J. Heal. Sci., 2014;1(4(S):92–105. doi: 10.21276/apjhs.2014.1.1s.19.
3. Ahmed EM. Hydrogel: Preparation, characterization, and applications: A review. Journal of Advanced Research. 2015;6(2):105-121. doi: 10.1016/j.jare.2013.07.006.
4. Shivani P, Shetye A., Godbole S, Bhilegaokar, Gajare P. Hydrogels : Introduction, Preparation , Characterization and Applications. Int. J. Res. Methodol., 2015;1(1): 47-71.
5. Aroguz A Z, Baysal K, Baysa BM. Preparation and characterization of hydrogels of several polysaccarides for biomaterials applications: Hydrogels for biomaterials applications. in ACS Symposium Series, 2010, doi: 10.1021/bk-2010-1061.ch007.

6. Gulrez SKH, Al-Assaf S, Phillips GO. Hydrogels : Methods of Preparation , Characterisation and Applications. Prog. Mol. Environ. Bioeng., 2003.

7. Gulrez SKH, Al-Assaf S, Phillips GO. Hydrogels: Methods of Preparation, Characterisation and Applications in Progress in Molecular and Environmental Bioengineering – From Analysis and Modeling to Technology Applications, 2011.

8. Aroguz AZ, Baysal K, Adiguzel Z, Baysal BM. Alginate/polyoxyethylene and alginate/gelatin hydrogels: Preparation, characterization, and application in tissue engineering. Appl. Biochem. Biotechnol., 2014;173:433–448. doi: 10.1007/s12010-014-0851-0.

9. Yuk KY. et al. Preparation and characterization of biodegradable hydrogels for tissue expander application. Polym., 2010, doi: 10.7317/pk.2010.34.3.253.

10. Sirousazar M, Forough M, Farhadi K, Shaabani Y, Molaei R. Hydrogels: Properties, Preparation, Characterization and Biomedical, Applications in Tissue Engineering, Drug, Delivery and Wound Care. in Advanced Healthcare Materials, 2014;43(3): 773-781.