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Alginate: Recent Progress and Technological Prospects

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Abstract

Alginate, a form of biopolymer, is used for industrial application due to its properties such as biocompatibility, nontoxicity, and biodegradability. It is called alginic acid. It can absorb water very quickly. Therefore, it is employed as an essential ingredient in manufacturing industries such as paper industry, textile industry, and food industry as a source of drinks, cosmetic products, ice cream, etc. It forms a hydrogel in the presence of millimolar concentration of calcium or even in the divalent cation such as barium or strontium. The properties of alginate are affected by its monomeric composition and molecular weight. Hence, necessary approaches are applied to yield alginates of different molecular weights, and reproducible physicochemical features are manipulating the culture state of fermentation. This chapter relates to the dynamic properties of alginate and also the innovative aspect of applying the alginate with various materials, such as nanomaterials or polymers.

Keywords: Alginate, alginate salts, calcium alginate, dietary fiber, cancer, cardiovascular, Parkinson's disease, marine pollution

3.1 Introduction

Polymers play a significant role to survive better in our daily lives. They are mainly made up of macromolecules comprising a large number of repeated monomers. They can be natural or synthetic in nature [1–4]. In the current era of science, polymer and its derivatives are considered necessary ingredients for good livelihood by replacing different artificial sources [5, 6]. There are various applications of polymers generally in different

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