Table of Contents

Ser	ies Ec	litors' Preface	iii
Abs	stract		vii
1.	Intro	oduction	1
2.	Production of biopolymers		
		Production of agar	3
	2-B	Production of agarose	3
		Production of alginate	3
		Production of carrageenan	3 3 3 3
	2-E	Production of cellulose: Plant and bacterial source	3
		Production of chitin and chitosan	8
	2-G	Production of starch	13
	2-H	Production of DNA	13
	2-I	Production of protein	15
3.	Cha	racteristics of biopolymers	23
		Molecular compositions of biopolymers	23
	3-B	Solubility properties of biopolymers	26
4.	Preparation of macro-, micro- and nano-materials using biopolymers		29
	4-A	Preparation of macro-, micro- and nano-sized particles using	
		biopolymers	29
	4-B	Preparation of micro- and nano-sized fibers using biopolymers	29
		Preparation of micro- and nano-sized pores in membranes using	
		biopolymers	33
	4-D	Preparation of micro- and nano-sized pores in scaffolds using	
		biopolymers	38
5.	Cha	racterization of macro-, micro- and nano-biomaterials	41
		Morphology, pore size and porosity of micro- and nano-biomaterials	41
		Water absorption property of macro-, micro- and nano-biomaterials	42
		Mechanical properties of micro- and nano-biomaterials	43
	5-D	In vitro biodegradation of micro- and nano-biomaterials	43
	5-E	Determination of metal content in micro- and nano-biomaterials	43
	5-F	Attachment, morphology, viability and proliferation of life cells on	
		micro- and nano-biomaterials	44
6.	Applications of macro-, micro- and nano-biomaterials prepared using		
	biopolymers		47
		Application of micro- and nano-biomaterials prepared using agar	47
		Application of micro- and nano-biomaterials prepared using agarose	47
		Application of micro- and nano-biomaterials prepared using alginate	47
		Application of micro- and nano-biomaterials prepared using carrageenan	47
	6-E	Application of micro- and nano-biomaterials prepared using plant	
		and bacterial cellulose	47

vi Biopolymers Based Micro- and Nano-Materials

50
50
50
50
53
55
61
55555