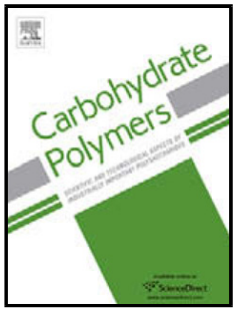

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Preparation and application of micro/nano particles based on natural polysaccharides

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Abstract. Polysaccharides have attracted more and more attentions and been recognized to be the most promising materials in recent years because of their outstanding merits such as easily available, non-toxic, biocompatible, biodegradable, and easily modified. Considerable research efforts have been directed towards developing polysaccharides-based micro/nano particles (PM/NPs). The major new studies of PM/NPs over the past few years are outlined in this review. Methods of preparation, including self-assembly, ionic-gelation, complex coacervation, emusification and desolvation method and some others are summarized. Different applications of PM/NPs in the field of drug delivery system are highlighted. Besides, another novel application of PM/NPs that are used as emulsifiers to stabilize Pickering emulsion is also introduced. These environmental-friendly particle-emulsifiers have received reasonable attention due to their novel applications, especially in food, cosmetics and pharmaceutics. From literature surveys, we realized that studies on PM/NPs systems for different applications have increased rapidly. Hence, the present review is timely.

Keywords: polysaccharides; micro/nano particles; pharmaceutics; Pickering emulsions

1. Introduction

Natural polymers can be generally divided into four different categories, including polysaccharides, proteins, nucleic acids and lipids (Krylov, 2009). Natural polymers are playing an important role in drug delivery systems, especially polysaccharides, due to their superior properties (Wang, Chen, Weng, Chen, & Xie, 2004). Polysaccharides are defined as polymeric carbohydrate structures composed of repeating monosaccharide units adjoined by glycosidic bonds. As natural biopolymers, polysaccharides are highly safe, non-toxic, stable biodegradable, and biocompatible. Besides, polysaccharides have abundant resources in nature and low cost in their