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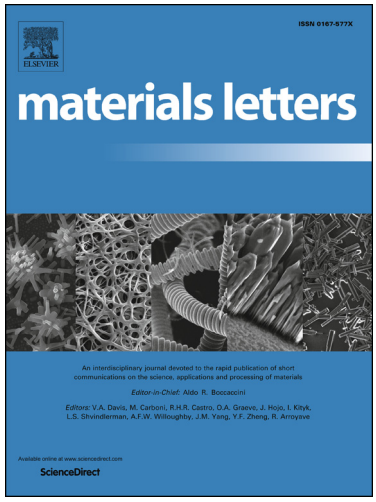

Snail-based nanofibers

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Snail-based nanofibers

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Abstract

Snail powders have many medicine functions. This paper uses the powders as additives for fabrication of nanofibers by the electrospinning and the bubble electrospinning, such work has never been studied before in any open literature. Unsmooth nanofiber is observed, and small fibers have higher acid-proof and alkali-proof properties, and their main reasons are revealed. Snail's slime involved in the powder has a fast immobilization property, and the immobilization process will blocks surface motion of the spun jets during the spinning process. Potential applications of the unsmooth nanofibers are predicted.

Keywords: Biofilm, biopolymer, natural dye, snail powders, mollusk, Byssus, sea silk, slime, fast immobilization, functional nanofibers, Li Shizhen (李时珍), Compendium of Materia Medica(本草纲目).

1. Introduction

Snails can be easily found after rains, they move very slowly and leave a trail of silvery slime, which is a kind of biofilms for lubrication and adhesive locomotion.

Snails have been widely used as a traditional Chinese medicine. Li Shizhen (李時珍,1518-1593) in his Compendium of Materia Medica(本草纲目)[1] gave a detailed description of snail's medicine functions. For examples, snail powders can treat urinary obstruction by putting them above navel, can prevent nosebleed by blowing the powers into nostrils, can cure deaf by dropping snail powers/wine solution into the ears, can soothe toothache and laryngeal diseases. Furthermore the snail solution obtained by putting snails in water or wine can be used for curing haemorrhoids, boils, scrofulosis, scars, and acne. It has also been used as skin creams for wrinkles and dry skin in cosmetics[2], and snail's secretion is a color-fast natural dye used in ancient times and was associated with royalty and wealth[3,4], modern medicine has also proved that snail's secretions can facilitate regeneration of wounded tissue[5].

The treatment of snails in Li Shizhen's Masterpiece[1] can be further improved using nanotechnology. In this paper, we will use the electrospinning and the bubble electrospinning to fabricate functional nanofibers using snail's powder as an additive, which has not been reported in any open literature. In this short letter, we want to prepare for nanofibers from some species of mollusk like snails and noble pen shells, the later has been used for producing a kind of ancient threads, called as Byssus or sea silk, which is one of the most rare and coveted materials in the world[5-9].

Many species of mollusk, both marine and terrestrial ones, can secret slimes or filaments that function to attach them to a solid surface. In this paper the secreted slims are used for producing functional nanofibers.

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