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Hybrid pectin-based biosorbents for zinc ions removal

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Highlights

- Hybrid pectin-based biosorbents with polysaccharide additives were prepared.
- The Zn sorption capacity of hybrid biosorbents is high in pH range 4-7.
- The various polysaccharide additives influenced sorbent structure and properties.

Abstract

In this paper, a set of the hybrid biosorbents, made of pectin and polysaccharide additives (arabic, tragacanth, guar, karaya, xanthan, gellan, carob gums, agar-agar) or lecithin (phospholipid), was investigated and tested for zinc ions removal. The immobilization of the polysaccharides into the pectin matrix was proved by the IR spectroscopy. The structure of the working biosorbents was observed in SEM micrographs. The influence of the additive type and pH on the sorption properties and swelling index was investigated. The maximum sorption capacities were achieved in pH above 4 and ranged from 17.7 to 25.4 mg/g for lecithin and xanthan gum as additives, respectively. The results show that the hybrid pectin-based beads are promising biosorbents for zinc removal from aqueous solutions.

Keywords: hybrid biosorbent; pectin; polysaccharide; zinc removal

1 Introduction

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