

Extended Abstract

Synthesis of Chitosan Based Biofloculants and Their Use for Microalgae Harvesting [†]

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The aim of this paper was to study the harvesting of microalgae, specifically *Chlorella vulgaris* and *Nannochloris* sp., with chitosan based biofloculants, synthesized from shrimp shell waste.

Microalgae harvesting remains one of the more expensive steps in microalgae cultivation, and is generally accomplished through chemical methods which involve inorganic and organic flocculants. Despite higher efficiency of chemical methods, their abundant use leads to contamination of both microalgae biomass and the growth medium, which is problematic further downstream for both the use of microalgae as feed for humans and animals, and also for the reuse of liquid medium. Chitosan has many advantages over commonly used flocculants for microalgae harvesting, as it is biodegradable and has no toxic effects on downstream applications [1,2].

The microalgae species which were used for these experiments, were grown in Bold Basal medium, respectively Zarouk medium, in a Sartorius PBR 25S photobioreactor with a capacity of 3 L. Chitosan powder obtained was mixed in three different acid solutions (citric acid, nitric acid and hydrochloric acid). For the determination of separation efficiency (SE): 5 ml of algal cells were placed in a 15 ml tube. Chitosan solution was added at different concentrations (0.25 g/L and 0.5 g/L) and mixed for 1 min. After mixing, the algal cells were allowed to settle down for 30 min. Samples of the supernatant were collected in order to measure the optical density at 680 nm by spectrophotometer.

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