Experiment 6: Preparation of chitosan films

Duration: First day: 30 minutes, second day: 5 minutes.

Equipment: *2* beaker (250 ml), magnetic stirrer with heating plate, stirring rod, Pasteur pipette, small-meshed strainer, 2 plastic plates (30 x 30 cm^2) or rinsing bowl.

Reagents: Chitosan, acetic acid, w($C_2H_4O_2$) = 12 %, tetraethylene glycol. *Procedure:* Two beakers are filled each with 2 g of chitosan and 100 ml of acetic acid. Under slight heating and stirring the chitosan is dissolved. After cooling one of the solutions is poured through a strainer onto a plastic plate or on the backside of a rinsing bowl. The content of the second beaker is mixed with 0.2 g of tetraethylene glycol and the mixture is stirred for some minutes. Afterwards this solution is poured through a strainer onto a plastic plate or on the backside of a rinsing bowl too. The slightly viscous solutions are not smoothed down. The solvent is allowed to vaporize overnight.

Observation: After the vaporization of the solvent in both experiments a flexible, tear resistant and transparent film remains, which is easily peeled off the plate. The film with additional tetraethylene glycol is softer than the pure chitosan film.

Faults and precautions: If the solutions are poured directly onto plastic plates without using strainer, it is possible that chitosan particles not dissolved completely cause thickenings and uneven patches. Besides, pouring through strainer prevents the formation of bubbles.

If too much of the softener is added, the two components separate and after some time the softener forms oily drops on the film.

Waste disposal and cleaning: Immediately after use the strainer should be cleaned with running water.