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Hochschule
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Project Proposal

For the Degree Program in Sustainability Studies

Electron beam assisted extraction of chitin and conversion to chitosan

Duration: 5-6 Months (27,5 ECTS = 825 h)

Location: Sigmaringen (Forschungsfabrik), partially Home Office

Possibilities for a follow-up Master's Thesis: yes

Potential Cooperation Partners (if applicable): None

Supervisor / Contact: Max Sturm, M.Sc.

Aim of the project: The aim of this project is to answer the scientific question: to what extent does e-beam treatment influence the process of chemical extraction of chitin and its subsequent conversion into chitosan?

Project description: Chitin is one of the most commonly found polysaccharides in nature. It is found in the exoskeletons of invertebrates, and in fungi, green algae and yeast. Chitin can be extracted by classical chemical extractions. However, this process requires large amounts of acidic and alkaline solutions. To reduce the amount of chemicals required or to be able to use more environmentally friendly chemicals, electron irradiation may be used. The extracted chitin can be converted to chitosan in a following step using chemical methods or electron beam treatment. Chitosan exhibits antimicrobial and antioxidant properties, which makes it a great material for food packaging applications. At end of life, it has the additional benefit of being biodegradable.

Suitable for / Requirements for the student: Preferred to be carried out in English. The student should be interested in the topic, have an independent way of working and be willing to familiarize themselves with chemical extraction processes and statistical analysis of experimental results.