Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name: Ding  
Given names: Luhui

Status (prof., assistant prof., …): prof

Laboratory: Transformations Intégrées de la Matière Renouvelable
Institution: Université de Technologie de Compiègne

Website address: www.utc.fr/timr and http://www.tai-team.fr
Website address: www.utc.fr

Scientific competence:
- protein fractionation with enhanced membrane filtration
- application of membrane separation technology in biomedical engineering
- pulsed flow filtration enhancement
- dynamic filtration using Dean vortices, rotating disk and vibrating filtration systems
- interaction of fluid-membrane in micro and ultrafiltration
- membrane processes for water treatment

Two major publications in the field proposed for the PhD:
Better damage of chicory tissue by combined electroporation and ohmic heating for solute extraction. Food and Bioproducts Processing, 2015, Volume 94, Pages 248-254.

Website address of the personal page: http://www.utc.fr/~ding/index_Angl.htm
Supervisor's email: luhui.ding@utc.fr and nabil.grimi@utc.fr

Description of the research work proposed for a PhD

Title: Alternatives extraction and concentration technologies for better recovery of alfalfa proteins

Subject:
Leaf protein is an important protein for animals and human consumption. This protein is industrially obtained from alfalfa juice. Conventional alfalfa leaf protein extraction and concentration methods include grinding, pressing and thermo-coagulation. However, this conventional separation and concentration methods have various intrinsic disadvantages, such as high energy cost, low separation efficiency, damage of nutritive proteins, complex operation and high investment, which can affect and limit their industrial applications. As an environmental friendly separation technology, membrane filtration can realize the goal of separation without addition of chemical substances, and the productivity of membrane filtration is easy to increase. Serious membrane fouling can generally occurred during protein separation process, which can limit the use of this technology. The principal objectives of this thesis are to study: (1) The extraction of leaf proteins from alfalfa juice by using different pretreatments (enzymes, pulsed power, ultrasounds) in order to increase the extraction yield and improve the proteins purity. These treatments should be compared to the conventional process, in terms of yield of the extract, the quality and functionnality of proteins. (2) The concentration of proteins by membrane technology as an alternative technique to thermo-coagulation. The protein recovery and membrane fouling mechanism during filtration. The impact of the pretreatment, filtration parameters (pressure, etc.).

Keywords: Alfalfa, extraction, separation, membrane, fouling control, proteins

Expected collaborations:
Professor Yinhua WAN and Prof. Jianquan LUO, Institute of Process Engineering, Chinese Academy of Sciences, Beijing, China. Email: yhwan@home.ipe.ac.cn
Dr. Zhenzhou ZHU, School of Food Science and Engineering, Wuhan Polytechnic University, 430023 Wuhan, China, email: zhuzhenzhou19831@gmail.com

Background required from the applicant:
Membrane separation, process engineering; mass transfer, chemical and biochemical analyses; chemistry

Existence of a PDF file detailing the proposal ("yes" or "no") : no
(see guidelines on the website www-csc.utt.fr)