Membrane filtration of microalga extract for recovering Polysaccharides: effect of the membrane characteristics and the ionic environment

Nicolas Brodu*†, Anthony Massé², and Rafik Balti³

¹Laboratoire de génie des procédés - environnement - agroalimentaire (GEPEA) – Université de Nantes, CNRS : UMR6144, Université Nantes Angers Le Mans – 37 bd Université, 44602 Saint Nazaire Cédex, France

²Laboratoire de génie des procédés - environnement - agroalimentaire (GEPEA) – Université de Nantes, CNRS : UMR6144, Université Nantes Angers Le Mans – 4, rue Alfred Kastler B.P. 20722 44307 NANTES, France

³Unité Enzymes et Bioconversion – Ecole Nationale d’Ingénieurs de Sfax, Université de Sfax, Km 4 Route Soukra, 3038 Sfax, Tunisie

Résumé

Numerous intra- or extra-cellular molecules coming from microalgae as well as those released in the culture medium, such as proteins, polysaccharides, lipids could find applications in cosmetic, nutraceutical, human health, food, feed, etc... Membrane ultrafiltration is an efficient process that can be used for the recovery and the purification of molecules without high molecule damages. Nevertheless, the ultrafiltration of biological extracts can be difficult due to the membrane fouling particularly in the presence of salts which promote the agglomeration of the molecules and change the interactions between the molecules and the membrane surface.

This study investigates the influence of operating conditions of micro/ultrafiltration on the performances of purification and concentration of Spirulina's extracts. Special emphasis is paid on the influence of the ionic environment (nature and concentration of the ionic species) on the recovery rate and concentration of polysaccharide and protein, the process productivity and the characterisation of the fouling.

Mots-Clés: microalgae, ultrafiltration, Polysaccharides

*Intervenant
†Auteur correspondant: nicolas.brodu@univ-nantes.fr