



Pressurized hot water extraction of 10-deacetylbaaccatin III from yew for industrial application

Maximilian Sixt, Jochen Strube

Institute for Separation and Process Technology
Clausthal University of Technology, 38678 Clausthal-Zellerfeld, Germany

In this study a systematic and model-based approach for a process development focusing on pressurized hot water extraction (PHWE) is investigated, considering potential thermal degradation of high-value compounds [Sixt & Strube 2017]. For extraction of 10-deacetylbaaccatin III (10-DAB) from yew as a representative test system, water at 120 °C provided the best compromise between extraction yield and thermal degradation. A yield of almost 100 % with regard to the overall amount of 10-DAB was reached in only 20 min. Each experiment for model parameter determination was carried out with 1.9 g of plant material at a flowrate of 1 mL/min and an applied pressure of 11 bar. All experimental values are assessed by a physico-chemical (rigorous) extraction model with experimental values and simulation results showing high conformity. In order to demonstrate the usability of the extraction model and model parameter determination a scale-up prediction was calculated. The scale-up experiments were predicted precisely and thus the model validated. The experiments and the simulation results for a column with a volume of 104 mL and a mass of 22 g yew needles were consistent with the milli-scale used for model parameter determination. The modelling approach as well as the parameter determination will be discussed in detail.

Literatur

Sixt, M., Strube, J., 2017: Pressurized hot water extraction of 10-deacetylbaaccatin III from yew for industrial application. *Resource-Efficient Technologies* 3(2), 177–186 2017. doi: 10.1016/j.reffit.2017.03.007