Separation of Rebaudioside D from Steviol Glycoside by Frontal Chromatography

By

Ka Chun Li

Date: 29 July 2019 (Monday)
Time: 14:00
Venue: Room 4582 (Lift 29-30)

Examination Committee:
Prof. Ping Gao, Chairman
Prof. Xijun Hu, Supervisor
Prof. Furong Gao

Abstract

Steviol glycoside (SG) is the non-caloric food additive extracted from stevia rebaudiana leaves. It is a mixture of four major components, which are Rebaudioside A (RA, about 30 wt.%), Rebaudioside C (RC, about 10 wt.%), Rebaudioside D (RD, about 10 wt.%) and Stevioside (STV, about 40 wt.%). The RD is capable of providing 250-300 times sweetness than the sugar and giving the clean aftertaste.

Conventional approach for separating each pure rebaudioside from SG is crystallization. However, such efficiency is limited when applying in different rebaudiosides’ concentrations in SG. In this study, therefore, an approach of the resin-based frontal chromatography has been investigated for RD separation in order to solve the deficiency of crystallization technique - slow production rate and low product yield.

Several resins were attempted for the study. In which, CAD40 resin shows distinctive capability for separating the RD from bulk SG. Samples with high concentration of RD were taken in the early part of breakthrough curve experiment. With this selectivity, the pure RD is able to be separated from the main stream under the optimized condition. This study shows the feasibility that the rebaudioside can be extracted by using suitable resin, which is not only achieved by the biocatalytic method – selective digestion by the enzymes.