



Continuous industrial enrichment of Aloe vera extract using TMB CPC system*

*True Moving Bed Centrifugal Partition Chromatograph

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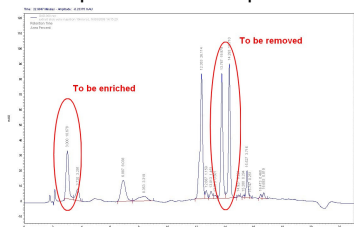
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Introduction



Aloe vera is a stemless or very short-stemmed succulent plant growing to 60–100 cm tall, spreading by offsets. It is common practice for cosmetic companies to add soap or other derivatives from *Aloe vera* to product cosmetic products. It should be noted that processed aloe that contains aloin is used primarily as a laxative, whereas processed *Aloe vera* juice that does not contain significant amounts of aloin is used as a digestive healer. Manufacturers commonly remove aloin in processing due to the FDA ruling

The aim of this study is to enriched an *Aloe vera* extract by removing all traces of two major impurities using TMB CPC technique. As this technology allows continuous injection it is suitable for production at industrial scale.



Apparatus



A complete Armen TMB CPC system set up with **TCPC-250** equipped with 2 columns of 125 ml, four **AP50 pumps** and **Armen Glider TMB software** was used to perform the purification.

HPLC was performed on **LaChrom Elite HPLC system** (VWR) equipped with Photodiode Array Detector (PDA) (200-800 nm) using Purisphere RP18e 250 mm x 4.6 mm I.D. 5µm column with pre column



Results

TMB CPC system allows to inject continuously the sample between two CPC columns and to recover from one side of the system the more polar compounds of the extract (which have more affinity for lower aqueous phase) and on the other side the less polar compounds of the extract (which have more affinities for the upper organic phase) [Figure 1]. Figure 2 shows the HPLC analysis of the crude *Aloe vera* extract to be enriched. The aims is to cut this chromatogram in two parts : the left part with the target compound and the right part with impurities.

The development of the method is based on the determination of the good solvent system that allows getting partition coefficient above one for all compounds on the left part and Kd over one for right part.

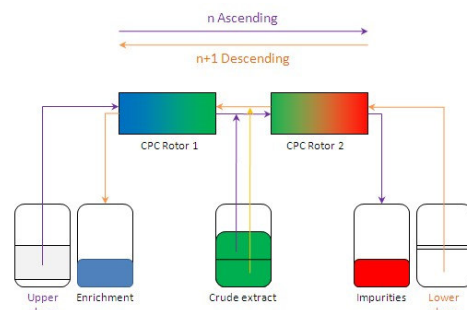


Figure 1

TMB CPC principle: Injection of crude mixture between both CPC columns continuously and recovery of enriched extract without any traces of impurities in the upper phase

Table 2 CPC conditions

Flow rate ASC	:10 mL/mn
Flow rate DSC	:10 mL/mn
Flow rate inj ASC	:5 mL/mn
Flow rate inj DSC	:5 mL/mn
Rotation speed	:2000 rpm
Injection volume	:Continuous
Sample	:crude powder in 50/50 up/low
Detection	:300 nm

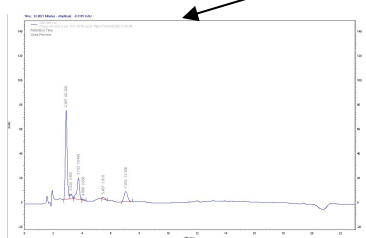


Figure 3: HPLC chromatogram of enriched fraction

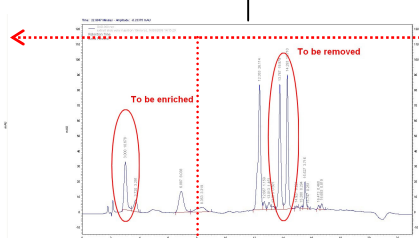


Figure 2: HPLC chromatogram of crude aloe extract

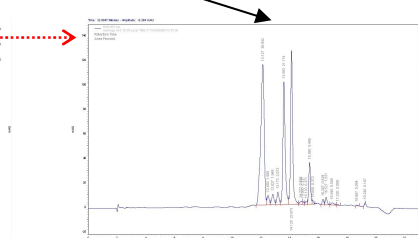


Figure 4: HPLC chromatogram of fraction with impurities

Figure 3 shows HPLC chromatogram of the fraction obtained in descending mode in the lower aqueous phase and Figure 4 shows HPLC chromatogram of the fraction obtained in ascending mode in the upper phase. It can be noticed that the enriched fraction does not contained any trace of the impurities to be removed.

Conclusion

The difference with a simple biphasic liquid extraction in funnel is that TMB CPC gives enough plate to be able to really obtain two different extracts without any traces from one part to another.

The size of the CPC TMB columns used defined the productivity.

Notes : This application note has been produced and edited using information that was available when the data was acquired for each article. This application note is subject to revision without prior notice