

# DE Application Note - Cannabinoid Purification

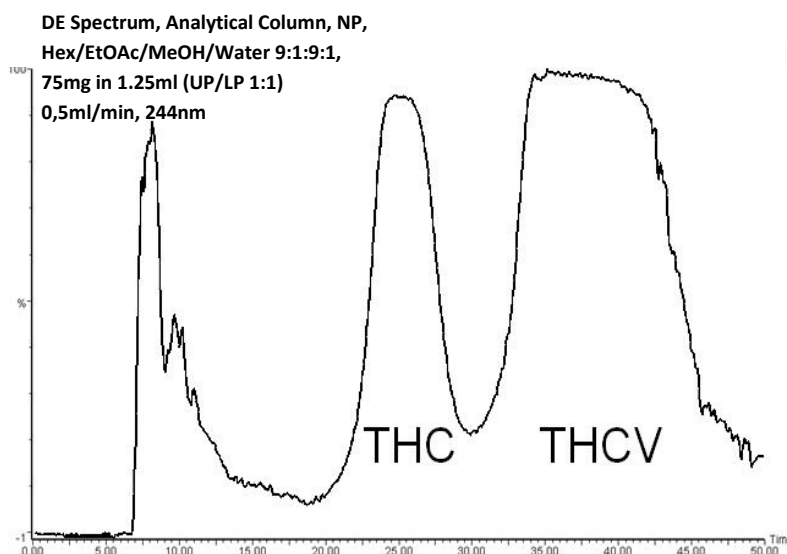
## Introduction

Cannabinoid drug therapy is used to alleviate the debilitating symptoms of pain and spasticity in multiple sclerosis and as potentially useful medication for various conditions, including migraine headaches, nausea and vomiting as a consequence of chemotherapy, wasting syndrome and appetite stimulation in HIV-infected patients etc. Cannabinoids extracted from natural sources are an important commercial resource. The customer has used a five litre CPC instrument extensively to purify such naturally sourced materials.

This application note describes the successful purification of such cannabinoids by High Performance Counter Current Chromatography (HPCCC) and compares the performance of the two techniques.

## Experimental

The separations were performed on a Dynamic Extractions Spectrum HPCCC instrument. The separation used Hexane/Ethyl Acetate/Methanol/Water (HEMWat) in the proportions 9:1:9:1 respectively initially in Normal Phase mode. The initial check of the method, transferred from the customer's CPC method, and limited loading capacity studies were performed on the analytical scale column. The separation was performed at 240g and Stationary Phase retention remained good at >80%.



Following chromatography, fractions collected between 32 and 46 minutes were combined and concentrated, in vacuo, to yield >90% recovery of >98% pure, THCV. Further method development culminated in a 1g scaled loading and the use of scaled run conditions on the Spectrum preparative column in Reverse Phase Mode. This experiment produced >90% recovery of >97% pure THCV. This separation was effectively completed in less than thirty minutes.

## Conclusions

The transfer of the technique from CPC to HPCCC was very successful. Shown in the table below are the results that demonstrate the significant impact on productivity that the use of HPCCC instead of CPC can have on such a separation.

Comparison of FCPC and HPCCC performance figures					
Instrument & Characteristic	FCPC	Spectrum HPCCC		Midi HPCCC	
		NP	RP	NP	RP
Column volume (ml)	5000	134	134	950	950
Flow rate (ml/min)	100	6	6	42	42
Typical SP retention	65-75	85	85	85	85
Cycle time (min)	180-240	55	30	55	30
Runs per day	1	6	12	6	12
Sample loading per run (g)	15-24	1	1	7	7
Solvent usage per cycle (ml/g)	>1000-1500	525	350	525	350
Throughput per day (g)	24	6	12	42	84