
QUATTRO CPC & CCC

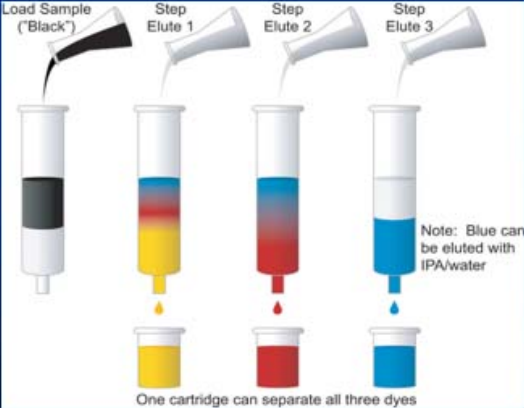
FOR MEDICINAL CANNABINOID PURIFICATION

Presentation Order

- Principles of Liquid-Liquid Quattro CPC Separations
- Biphasic Liquid – Liquid Chromatography
- Operation of Quattro CPC
- Medicinal Cannbinoid Separations
- Commercial Future of CPC Cannabinoid Purification

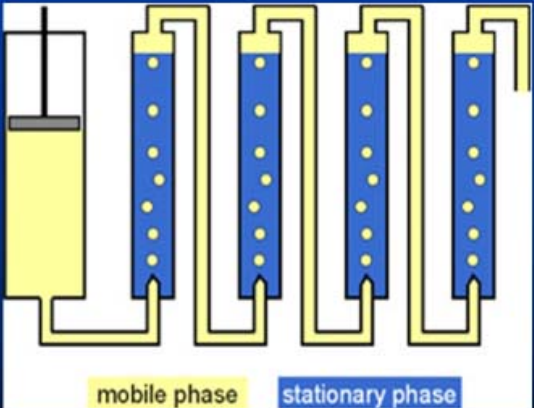
Principles of Liquid-Liquid Quattro CPC Separations

What is Liquid-Liquid Chromatography ?



Typical Solid-Liquid Separation

Mixture of compounds absorbed onto a solid support media. Isocratic or gradient or step elution will partition differentially into various component compounds. Partitioning a function of relative affinity of compounds for stationary and mobile phase



Typical Liquid-Liquid Separation

Mixture of compounds injected onto an gravitationally immobilised stationary liquid phase from a biphasic mixture. The other phase flows through. Compounds are differentiated by their partitioning between phases. Above example is of ascending mode, upper mobile

Biphasic Liquid – Liquid Chromatography

Choices Available: - Your options are unlimited

- Infinitely non-polar compounds such as engine oils.
- **Mid polar compounds such as cannabinoids.**
- Highly polar compounds such as proteins, mAb's.
- Inorganic compounds, precious metals, radioactives.
- **HOW...???**
- Biphasic choices include
 - Non-polar: Heptane : Acetonitrile Etc. Biphasic
 - **Mid polar: Heptane : Ethanol : Water Etc. Biphasic**
 - Polar Organics & Inorganics: Water : Water Biphasic

Operation of Quattro CPC

All same principles and instrumentation as HPLC:- pumps, injector, detector, column, fraction collection, with computer control and data collection.

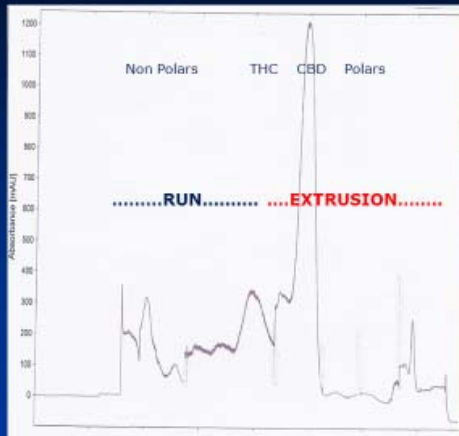


Shown: Quattro LabPrep™ plus Quattro PilotPrep™ CPC.

ProcessPrep™ same chassis as PilotPrep™

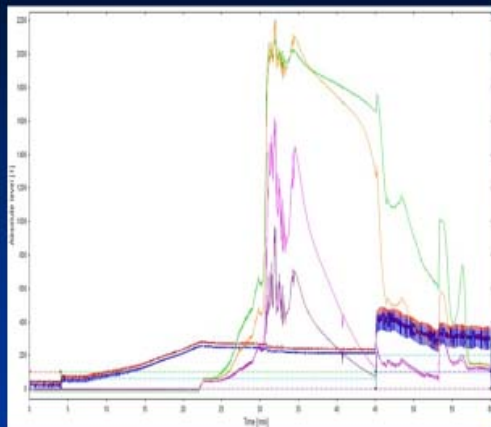
Medicinal Cannabinoid Separations

Shown below is a Process Ascending Chromatograph of Hemp Extract



Quattro ProcessPrep™
12 Litre CPC.

Approximate mass balance achieved



Quattro PilotPrep™
4.8 litre CPC.

Ultra high mass loading achieved

Commercial Future of CPC Cannabinoid Purification

- If Presently Specialising on THC or CBD Purifications.
- Use CPC to Remove THC from Broad Spectrum Hemp extracts.
- What about the future?
- Obtain high priced minor cannabinoids such as THCV, CBN, CBC, CBG etc
- USA prices reducing for THC & CBD.
- Co-research Bioactivity to define bioactives & deliver designer IP bioactive mixes.
- Future legislation?
- What are the Future Maybes?

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ANY QUESTIONS?