CENTRIFUGAL PARTITION EXTRACTION AS AN EFFICIENT TOOL FOR NATURAL EXTRACT FRACTIONATION AND METABOLITE SCREENING

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Centrifugal Partition Extraction (CPE) is an innovative solid support free separation technique derived from Centrifugal Partition Chromatography (CPC), with a column design characterized by less cells of larger volume. These particular features make possible to pump the mobile phase at higher flow rates while maintaining a good hydrodynamic stability of the biphasic solvent system. Here are presented different applications of CPE, either for the highly productive purification of ionic molecules when combined to the strong ion-exchange displacement mode or for the rapid and selective fractionation of complex crude extracts when using a triphasic solvent system in a sequential elution mode. The respective results indicate that CPE offers promising perspectives in natural product research not only for preparative and pilot-scale purification purposes, but also for the determination of crude extract composition and screening of bioactive molecules.

APPARATUS[1]

FCPE300®

Column (303 mL)
7 partition disks

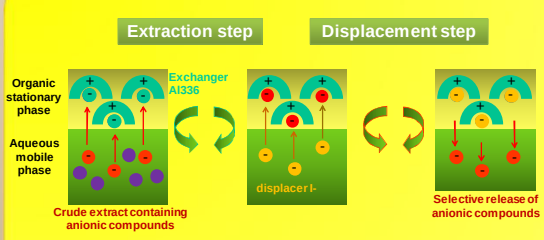
Partition cells
n = 231 twin-cells
Volume = 1 mL/cell

CHARACTERISTICS

- **LIQUID-LIQUID** separation system
- Design **evolved from CPC**, but with less partition cells (231ź 1000) of larger volume (1ź 0,130 mL)
- Flow rates up to 300 mL/min Ÿ High **PRODUCTIVITY**
- **VERSATILITY** : A **wide range of solvent systems** can be used (biphasic, triphasicé , organic-aqueous, ATPSé) and **different development modes** can be applied (isocratic or gradient elution, ion-exchange, pH-zone refiningé)

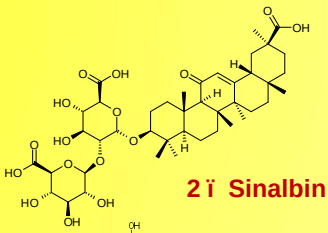
CPE - ION-EXCHANGE MODE : DIRECT PURIFICATION OF IONIC COMPOUNDS[2,3]

Case of anionic compounds



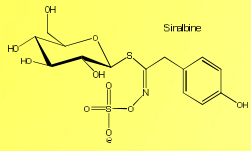
- Solvent system = EtOAc/*n*-BuOH/H_2O (3/2/5 v/v)
- Anion-exchanger = Aliquat336 (NH_4+)
- Displacer = potassium iodide (I-)

1 - Glycyrrhizin from licorice roots



- Injection = 20 g of crude extract
- Flow rate = 20 mL/min
- Experiment duration = 95 min
- Recovery = 86% (2.2 g)
- Purity = 86.3%

2 ï Sinalbin from white mustard seeds



- Injection = 25 g of crude extract
- Flow rate = 30 mL/min
- Experiment duration = 32 min
- Recovery = 92% (4.6 g)
- Purity = 95%

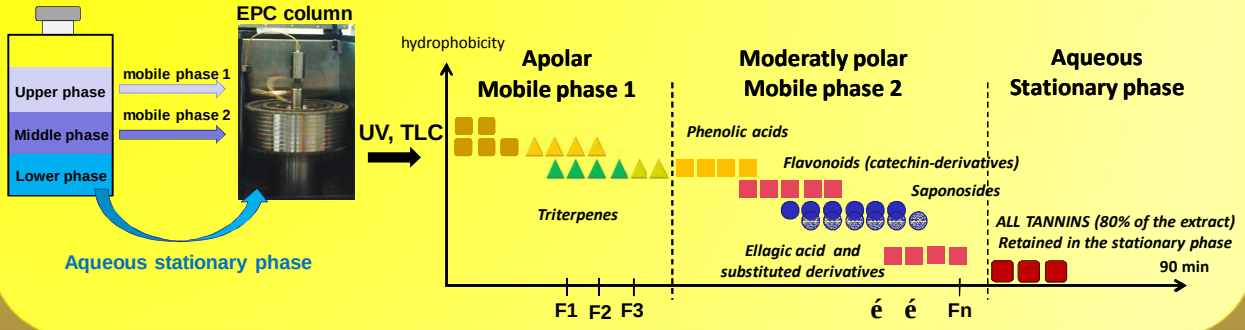
CPE - ELUTION MODE : SELECTIVE AND RAPID FRACTIONATION OF NATURAL EXTRACTS[4]

3 ï *Anogeissus leiocarpus* (Combretaceae)

Bark extract (EtOH 99%)

- ✓ Antiparasitic activity (African traditional medicine)
- ✓ Cosmetical applications (in Europe)

Three phase solvent system : *n*-heptane/MtBE/ACN/eau (1:1:1:1 v/v)



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