

Innovation for pretreatment for HPLC, LC/MS, LC-MS/MS Application of SPE-VC



(Combination with Solid-Phase Extraction(SPE)- Vacuum-Assisted Vortex Concentration (VC))

One step method for compound extraction Short cut sample preparation for HPLC, LC/MS, LC-MS/MS

Hurdles for compound extraction by liquid-liquid extraction (LLE)

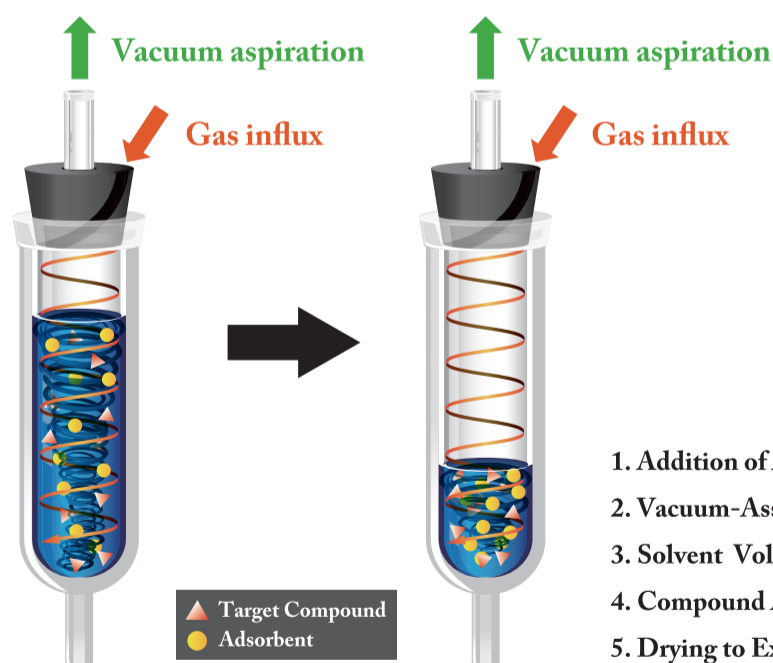
- Extraction and partition are time consuming processes.
- Difficulty of small sample handling and processing when it is less than 3ml
- Difficulty of simultaneous multiple sample extraction
- Inefficient operability under the presence of involatile salt
- Sample loss due to repetitions of sample substitutions

Advantages of SPE-VC (SPE Eluent Concentration using Vacuum-Assisted Vortex Concentration)

- 6 times faster than LLE
- Efficient recovery of samples
- Less damage to heat-unstable compounds
- Available for multiple samples
- Avoiding sample loss
- Extraction under room temperature
- Suitable for concentration of unknown compounds
- Use less organic solvent = Green Chemistry

Concept Diagram of SPE-VC

① Vacuum-Assisted Vortex Concentration (VC)



1. Addition of Adsorbents to sample solution
2. Vacuum-Assisted Vortex Concentration
3. Solvent Volatilization
4. Compound Adsorption to Adsorbents
5. Drying to Exsiccation

② Solid-Phase Extraction



6. Elution with Solvents
7. Compound Extraction

③ Analysis

- HPLC
- LC/MS
- LC-MS/MS

Comparative Study on HPLC Sample Preparation Efficiency between LLE and SPE-VC using Vitamin D

	LLE	SPE-VC
Time for Sample Preparation	60 min	10 min
Operability for small volume sample	Difficult	Sample less than 3 ml is O.K.
Simultaneous multiple sample extraction	Difficult / Only 1 sample	6 samples at maximum
Operability under the presence of involatile salt	Difficult	Easy
Sample substitutions	Many	1 step
Stability of extracts	Good	Good
Sample recovery rate	High	High