



On-Site Workshop: Predictive Formulation Sciences & Their Applications

Led by VLci Experts



The applied predictive formulation sciences **Hansen Solubility Parameters (HSP)** and **Hydrophilic Lipophilic Difference – Net Average Curvature (HLD-NAC)** are very powerful for finding matching ingredients, resulting in improved stability and efficacy of end-products. These models are applicable to **solutions, dispersions** and **emulsions**, which basically includes all types of formulated products. Although they have been applied for many years, there is still a limited use of them in formulation developments and ingredients thereof. The equations of these sciences require the input of (practical) parameters from the ingredients which, once generated, can **predict (in)compatible ingredients** to **develop and optimize specific formulations**. The ingredient's data generated from these models is **predictive and sustainable**: you can use them over and over, allowing to **move away from trial-and-error** and to use digitalization effectively into product developments. This is a very efficient way to enhance the properties of a formulation and to **reduce complexity, time** and **cost** of its development. When combined with High Throughput (HT) screening for automated, parallel and small-scale preparation of samples and end-products, further efficiency can be achieved. These predictive formulation sciences find their use in a wide variety of applications; coatings, personal care, household, polymers, agrochemicals, EOR, pharmaceuticals, etc.

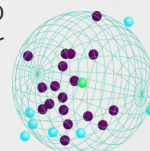
Hydrophilic Lipophilic Difference Net Average Curvature (HLD-NAC)



Allows **profound predictions** to be made about the **type of emulsion** (o/w, w/o, micro-emulsion) and the **suitability and efficiency of a surfactant** for defined formulations. The HLD-NAC approach is **widely applicable** to various types of oils and both anionic and non-ionic surfactants, as well as other conditions of the emulsion.

Hansen Solubility Parameters (HSP)

Characterizes an ingredient/product by its **interaction parameters**; **δD** - dispersion forces, **δP** - Polarity, and **δH** - Hydrogen bonding. Based upon these, the product **compatibility and incompatibility can be predicted** with other ingredients to build up an entire formulation or improve an existing formulation.



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What you will learn in this workshop

- ◆ An introduction to the predictive sciences and the ingredient parameters they require, via **presentations** and **case studies** of their use in efficient product development.
- ◆ How to **determine the required ingredient parameters** via practical **sample preparation**, **rating of samples** and the **use of software/apps**.
- ◆ **Implementation of the parameters** to find matching ingredients, to make incompatible ingredients become compatible and to develop formulations based upon predictions.
- ◆ For which applications the sciences can be used and **how the strategies aid effective implementation**.
- ◆ **Interact with experts** and obtain as much knowledge as possible to **get started with the implementation of these predictive formulation sciences in your own labs**.



Level required to attend this workshop

- ◆ A **basic understanding of ingredients and formulation**; you know the function of several different ingredients, and how to use them to develop formulations.
- ◆ A **brief look at the predictive formulation sciences HSP and HLD-NAC**:
<https://www.stevenabbott.co.uk/practical-solubility/>
<https://www.stevenabbott.co.uk/practical-surfactants/>
- ◆ And also **articles showcasing many different applications** on our website:
<https://vlci.biz/our-work/>



On-Site Workshop: Predictive Formulation Sciences & Their Applications

- ◆ Duration: 2 days
- ◆ Cost: €3.500/day, excluding travel expenses, sample and shipment costs (for maximum 10 attendees)



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