CHAUVIN ARNOUX
INDATECH

ASURYAN
UV-VIS SPECTROSCOPY



Analyses possible with Asuryan:

- Liquids of various natures and in various states
- Chemical composition of products
- Downstream process monitoring
- Analysis of vaccines
- Vitamins for chemical industry products
- Nanoparticles in suspension (e.g. ZnO_2, CuO, TiO_2, et
- Intralipid globule size and form of crystals



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A key player in industrial measurement

- Actors in measurement **since 1893:** foundation of Chauvin Arnoux (worked with Marie Curie
- A passion for measurement **passed on from father to son**
- The Group's head office at the gates of Paris, in **Asnières-Sur-Seine, France**

1000 employees

- **Keep** our design **expertise** in-house via our **integrated R&D teams**
- **Master** the whole **industrial production line** and the traceability of our products
- **Strong relation with customer need.**



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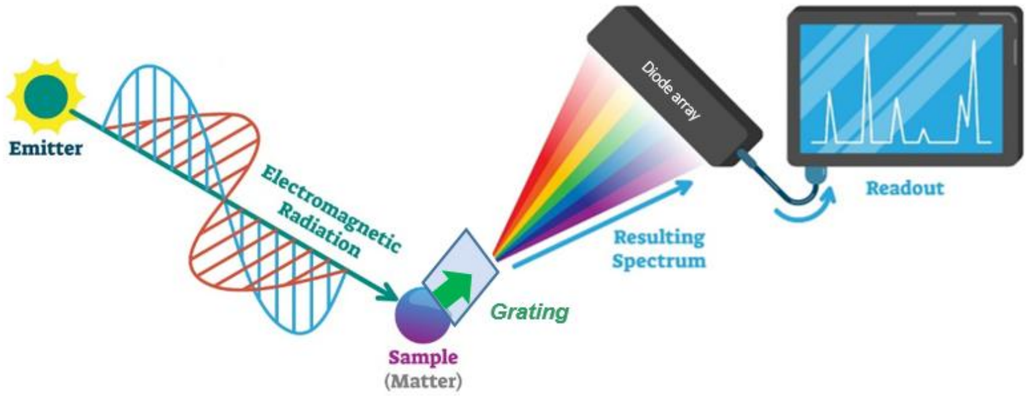
Designed by Industry, for Industry: The Story Behind Our UV-VIS System

Our UV VIS instrument wasn't just built—it was **shaped by the needs of industry leaders**. Pionneers in the Pharma & Biotech sector, **GSK & Ferring** challenged us to develop a solution tailored for Biotech **downstream continuous manufacturing processes;**

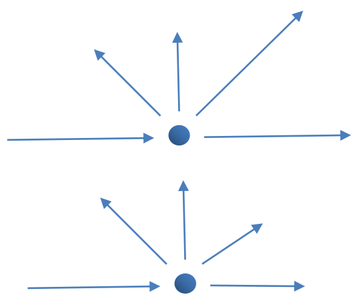


By combining **cutting-edge technology with real operational needs**, we've created a system that **meets the rigorous demands of industrial applications and regulation**, ensuring both **precision and reliability**—without compromising on **operator safety**.

OUR UNIQUE TECHNOLOGY:
Taking into account the spatial aspects



Diffusion varies according to:
- The size,
- The shape,
- The composition,
- The number of particles.

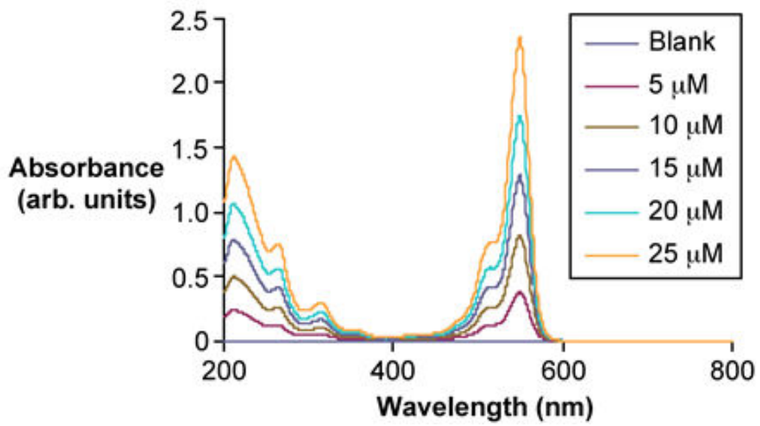


D>λ

D<1/(10xλ)

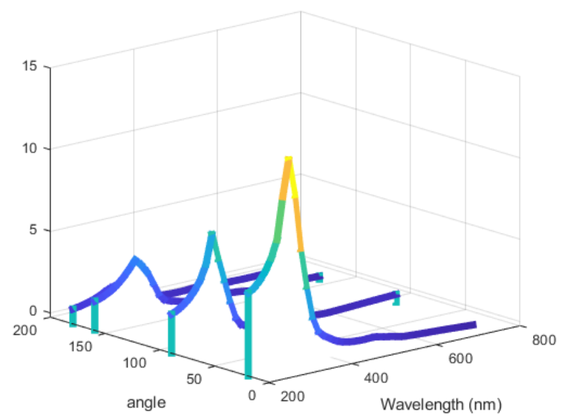
UV-VIS absorption measurement

UV-VIS 200-800nm



UV-VIS absorption measurement

UV-VIS 200-800nm



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Technical Specifications ASR

Robust & flexible design:

- Stainless steel box
- Single ormultiple channel
- Can be control by a computer or vis virtual machine

Wide spectral range :

- Specific Dual Lamp module UV 200-450) and VIS (450-800nm)
- Spectral range 200-800nm with spectral resolution 6.5nm
- 3 Simultaneous channel with dedicated spectrometer
- 1 internal monitoring of light source



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ASURYAN

Optimal Industrial Technologies

SIEMENS

PCA / PLS model .usp

SIMCA®-Q

(AUTOMATION)

OPC-UA / TCP/IP

Hardware of analyzer

READY
INDATECH SOFTWARE

'RECIPE'

Data exported as SPC

PLS/PCA Model .usp

Call module

SIMCA®-Q

PLS_Toolbox Model exporter



PCA / PLS modelling

SIMCA®

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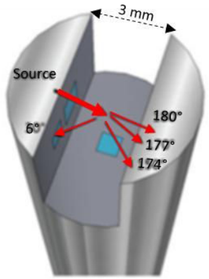
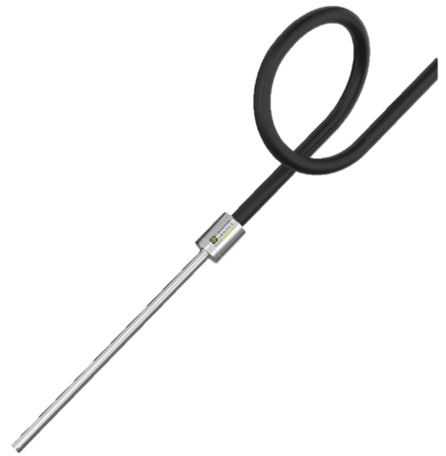
Wide range of accessories



Standard probes

- Transmission
- Transflexion
- ATR





Multiangle probe

- Collimated beam
- Non Collimated beam
- Backscattering

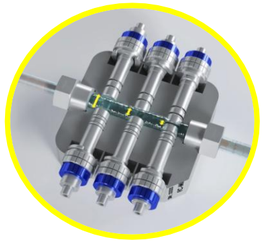
Flow cell

- Different connector
- Different diameter



3 pathlength Flow cell

- Slope Spectroscopy approach
- NIR UV combination
- Multi-step process



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Technical Specifications ASR MkII



PLC computer integrated

Native embedded OPC-UA software

Specific cuvette for USP test

Possibility to add external I/O signal

Dedicated filter for applications

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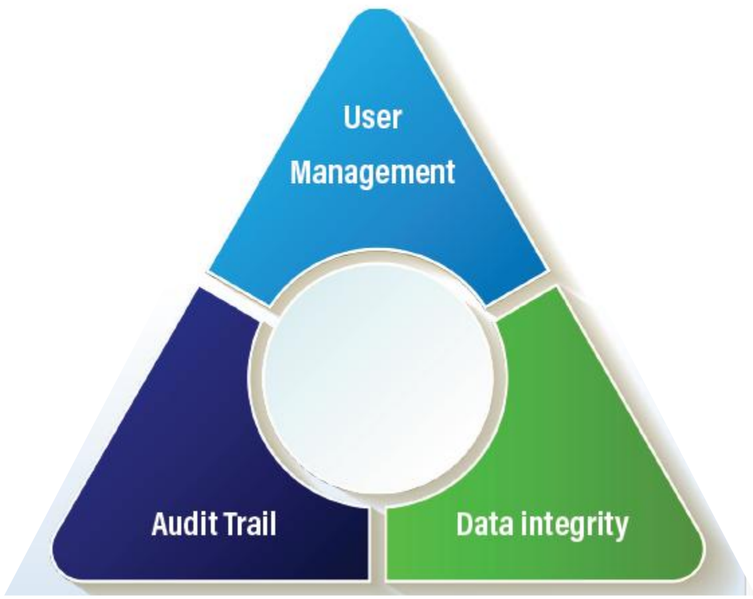

Advantage of 21 CFR part 11 :

- System Validation based on IQ/OQ ensure the system is ready to provide correct result
- Full data Security (Safety, protection and integrity of data
- Audit Trail
- Data integrity
- Electronic record storage
- Authenticated signatures and control of user authorization
- Version Control
- Closed system

Table 1: RSV modules available for each spectroscopic technology

Asuryan (UV-Vis)	SAM-Spec (NIR)	Viserion (Raman)
Reference	Dark	Wavelength Accuracy
Wavelength Accuracy	Reference	Photometric Precision
Wavelength Precision	Wavelength Accuracy	
Photometric Accuracy	Photometric Accuracy	
Photometric Precision		
Stray Light		

Routine system verification :

- RSV is integrated in our software to automate the process
- Advanced functions for continuous monitoring of instruments performance

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Lab to pilot , or pilot to production

Preparing installation of Analyzer :

Automation :

- We provide a free OPC UA and TCPIP simulator to start working early in integration and automation

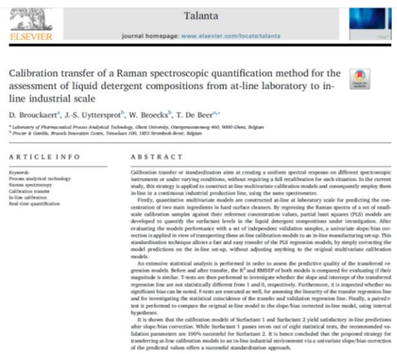
Mechanical and cleaning study :

- We can provide dummy probe



Installation of analyser:

- Calibration Transfer



Talanta

journal homepage: www.elsevier.com/locate/talanta

Calibration transfer of a Raman spectroscopic quantification method for the assessment of liquid detergent compositions from at-line laboratory to in-line industrial scale

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ARTICLE INFO

Keywords:
Process analytical technology
Raman spectroscopy
Calibration transfer
In-line calibration
Real-time quantification

ABSTRACT

Calibration transfer or standardisation aims at creating a uniform spectral response on different spectroscopic instruments or under varying conditions, without requiring a full recalibration for each situation. In the current study, this strategy is applied to construct at-line multivariate calibration models and consequently employ them in-line in a continuous industrial production line, using the same spectrometer.

Firstly, quantitative multivariate models are constructed at-line at laboratory scale for predicting the concentration of two main ingredients in hand surface cleaners. By regressing the Raman spectra of a set of small-scale calibration samples against their reference concentration values, partial least squares (PLS) models are developed to quantify the surfactant levels in the liquid detergent compositions under investigation. After evaluating the models performance with a set of independent validation samples, a univariate slope/bias correction is applied in view of transporting these at-line calibration models to an in-line manufacturing set-up. This standardisation technique allows a fast and easy transfer of the PLS regression models, by simply correcting the model predictions on the in-line set-up, without adjusting anything to the original multivariate calibration models.

An extensive statistical analysis is performed in order to assess the predictive quality of the transferred regression models. Before and after transfer, the R^2 and RMSEP of both models is compared for evaluating if their magnitude is similar. T-tests are then performed to investigate whether the slope and intercept of the transferred regression line are not statistically different from 1 and 0, respectively. Furthermore, it is inspected whether no significant bias can be noted. F-tests are executed as well, for assessing the linearity of the transfer regression line and for investigating the statistical coincidence of the transfer and validation regression line. Finally, a paired t-test is performed to compare the original at-line model to the slope/bias corrected in-line model, using interval hypotheses.

It is shown that the calibration models of Surfactant 1 and Surfactant 2 yield satisfactory in-line predictions after slope/bias correction. While Surfactant 1 passes seven out of eight statistical tests, the recommended validation parameters are 100% successful for Surfactant 2. It is hence concluded that the proposed strategy for transferring at-line calibration models to an in-line industrial environment via a univariate slope/bias correction of the predicted values offers a successful standardisation approach.



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APPLICATIONS

Chemicals

Color measurement

Measurement of suspensions and emulsions



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LES DOMAINES D'APPLICATION

Environment

Detection of residues at low concentrations

Checking of cleaning

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