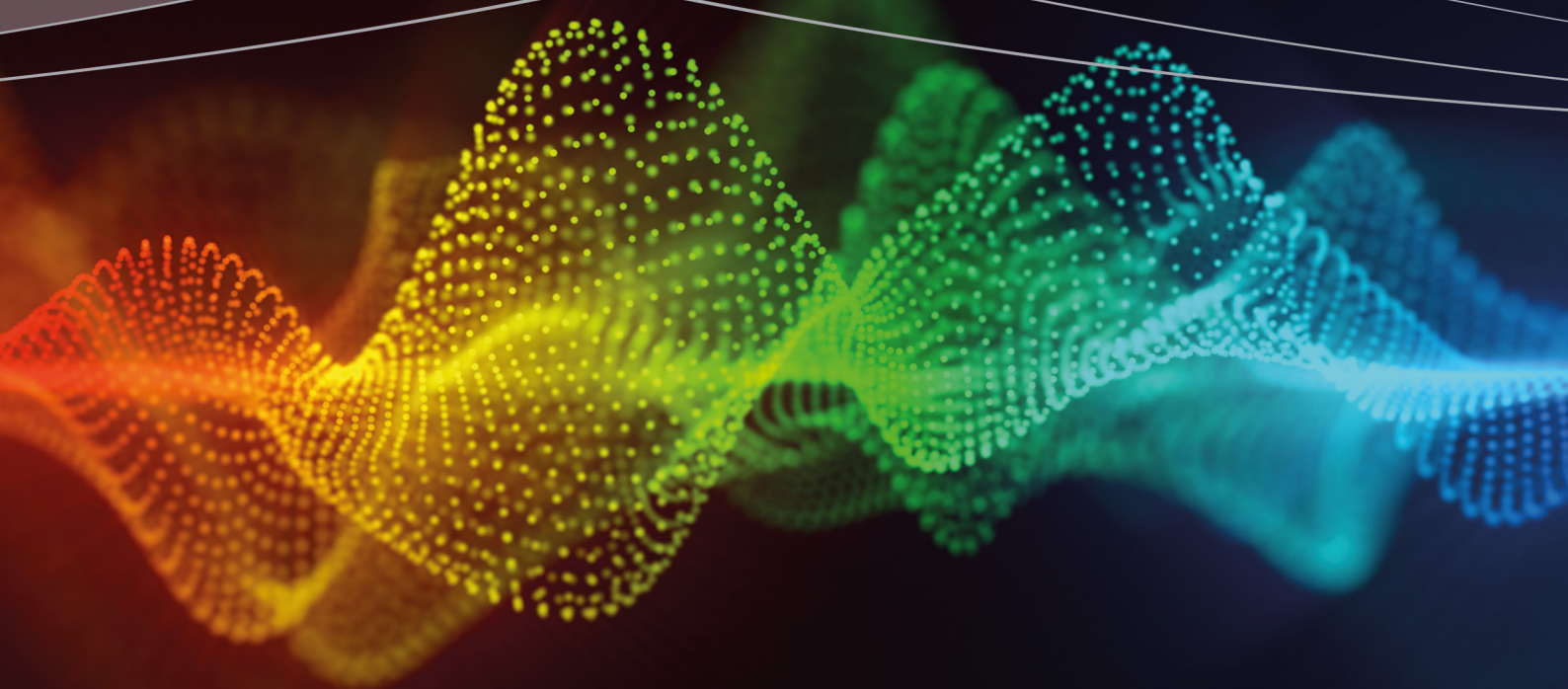


Intelligent Peak Deconvolution Analysis (i-PDeA)

Show the peak behind the peak

i-PDeA to differentiate co-eluting peaks
in (U)HPLC-PDA analysis



Powerful tool for impurity detection

Superior hardware meets unique software functionality

Shimadzu's sophisticated software tool confirms contaminants or impurities in raw materials or final products. Besides a broad range of applications, this is particularly interesting for the pharmaceutical industry.

Faster peak separation and impurity detection in PDA detectors

i-PDeA is an innovative data processing method for photodiode array (PDA) detection. i-PDeA stands for intelligent Peak Deconvolution Analysis.

By analyzing PDA detector data, it accurately extracts and quantifies a single component from co-eluting or poorly resolved peaks, without the need for mass spectrometry (MS) detection.

Reduced efforts to achieve baseline separation

Using the multivariate curve resolution alternating least squares (MCR-ALS) technique, i-PDeA reduces the necessary effort to further optimize separation parameters to achieve baseline separation.

The i-PDeA data analysis solution combines hardware and software features:



ANALYTICAL
INTELLIGENCE



- Automated support functions utilizing digital technology, such as M2M, IoT, and Artificial Intelligence (AI), that enable higher productivity and maximum reliability.
- Allows a system to monitor and diagnose itself, handle any issues during data acquisition without user input, and automatically behave as if it were operated by an expert.
- Supports the acquisition of high quality, reproducible data regardless of an operator's skill level for both routine and demanding applications.

Choice of Shimadzu PDA detectors applicable for i-PDeA functionality:

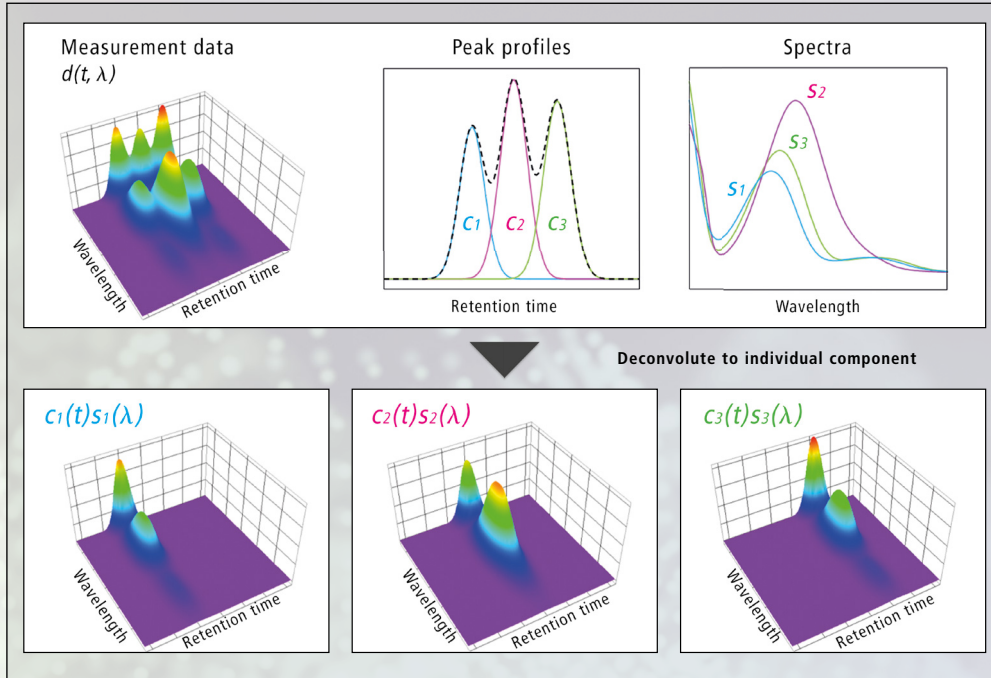
- The SPD-M40 detector for high-sensitivity analysis of impurities achieves superior spectrum resolution and linearity (up to 2.5 AU). The UV cut-off filter installed in the detector prevents sample degradation due to UV light, helping to maintain good linearity at low concentrations. Temperature-controlled optics lessen the impact of external temperature changes.
- Through ultra-high sensitivity and resolution, the SPD-M30A detector serves all the needs for UHPLC analysis. It offers a superior dynamic range that allows for simultaneous analysis of main component and impurity with a concentration of only 0.005 %. This enables the quantification of a very low concentration of impurities in highly concentrated samples.

Nexera series of (U)HPLC systems

These highly advanced liquid chromatography systems offer unsurpassed efficiency, sensitivity, resolution, stability, and reliability. Their flexible design offers the perfect instrument for a great variety of applications.

Boosts efficiency in UHPLC/HPLC applications

Isolate co-eluting peaks based on spectral differences



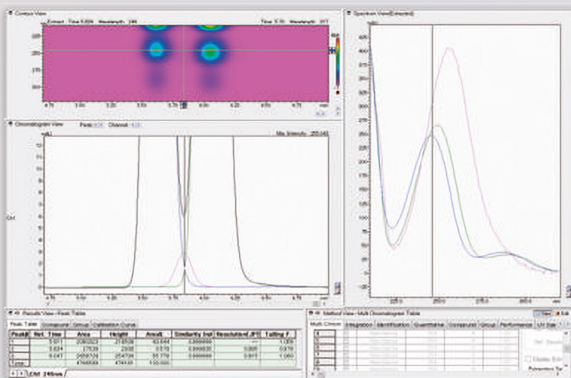
i-PDeA integrated in LabSolutions chromatographic data system (CDS)

This easy-to-use and intuitive data acquisition and analysis software allows for efficient management of instruments and analytical data while offering data integrity as well as full FDA 21 CFR Part 11 compliance. Combining the LabSolutions i-PeakFinder's completely automated integration function, peak purity detection and i-PDeA signal deconvolution results in a higher level of integration accuracy and confidence in the data obtained.

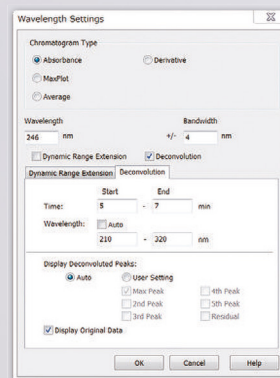
Easy and convenient handling

Setting up i-PDeA in the LabSolutions software is a simple 3-step procedure:

1. Collecting spectral data during analysis
2. Specification of time range for deconvolution
3. Display of single component peaks



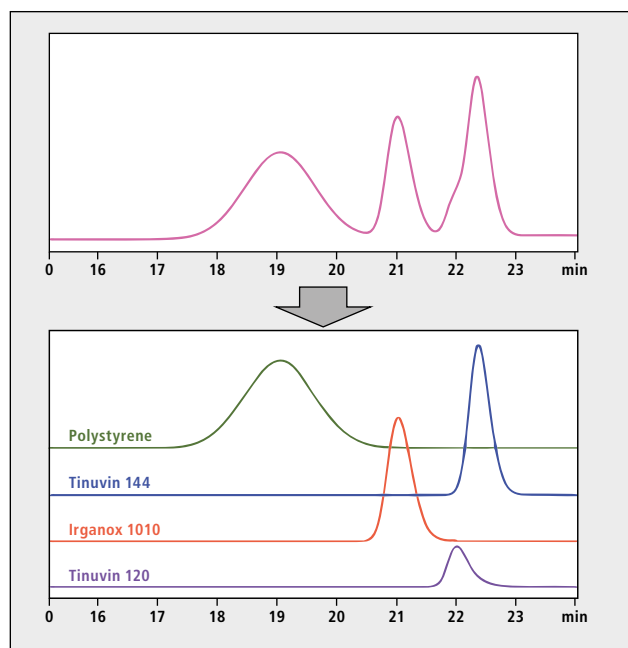
PDA Data Analysis Window in LabSolutions



Window for i-PDeA II Settings

Unrivalled solution for visualization of single component peaks using PDA detection

The novel i-PDeA approach enables the visualization and detection of a minor single impurity even when it is coeluting with a main component. It also allows for the accurate integration and quantification of poorly resolved isomers which cannot be distinguished by mass spectrometry. This unique software functionality is only available in LabSolutions. Without additional method optimization efforts, it provides an unrivalled solution for single peak detection and quantitative analysis using absorbance detection.



Simultaneous analysis of polystyrene and three additives using i-PDeA II

Faster analysis and increased lab productivity

Using the i-PDeA tool results in a more efficient workflow as it reduces the effort required to further optimize separation parameters to achieve baseline separation. By offering single peak extraction, it improves data reliability, removing quantitative errors due to peak integration ambiguities. Based on its state-of-the-art PDA performance, superior HPLC/UHPLC system reproducibility, and incorporation of advanced signal processing, it helps to speed up method development and sample analysis, thereby increasing lab productivity.

www.shimadzu.eu/i-pdea-analysis



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