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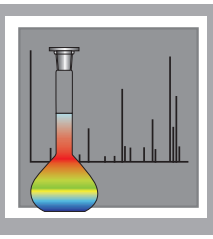

Highlights of Analytical Chemistry in Switzerland

Division of Analytical Chemistry

A Division of the Swiss Chemical Society

21st Century HPLC Method Development

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Developing chromatographic methods to separate impurities in drug substance and product can require indefinite amounts of time and effort and result in methods that may still not be robust. The Solvias approach considers all of the operating parameters in such a way that methods are developed in the shortest time whilst also delivering the highest assurance of robustness. How is this achieved?

Method Development Strategy

1. Assess the physico/chemical properties of the analytes.
2. Use short sub-3 micron LC columns for fast chromatography.
3. Select up to six stationary phases, based upon selectivity differences and security of supply of columns.
4. Select up to two organic and twelve aqueous mobile phases, *e.g.* different pH values based upon pKa, log P, and theoretical stability of the analytes.
5. Select the gradient times.
6. Select as many temperatures as desired.
7. Model the results using retention modelling software. Decide upon the best conditions considering speed, resolution, and robustness (areas of the design space in which changes would still produce an adequate performance).
8. Verify the optimum conditions predicted by the software.
9. Up-scale to a longer LC column (if required).
10. Optimise the reporting.
11. Proceed to method validation.

Established methods for quality control have a well-defined design space making it an easy task to incorporate new data from stability studies to expand the model reliably for stability indicating purposes. For example, the resolution map shows the optimum separation of 11 components (the red part of the diagram). The predicted separation was verified and showed a good fit.

Chromatographic separations are often developed in an unsystematic *ad hoc* manner leading to problems later on. State of the art practices and experience can be used to accelerate method development and to provide robust methods that are supported by scientifically sound design space.

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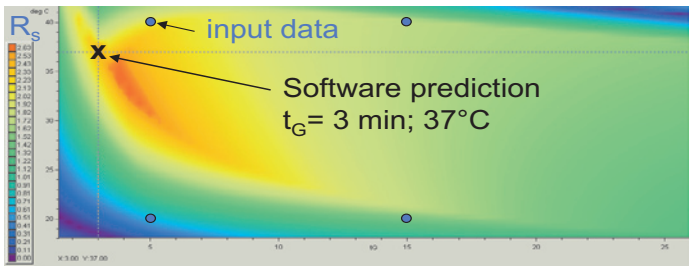
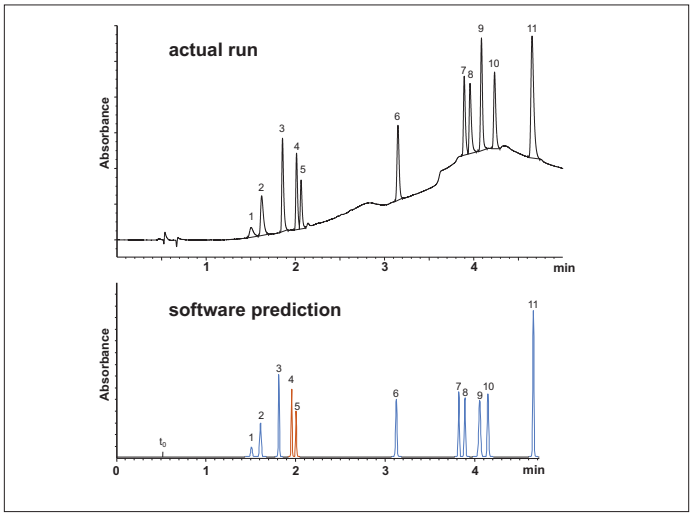
HPLC method development platform with high pressure option up to 600 bar.



Resolution map for the gradient time/temperature model for eleven compounds.



Comparison between predicted and experimental separation of eleven compounds.

Can you show us your analytical highlight?
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