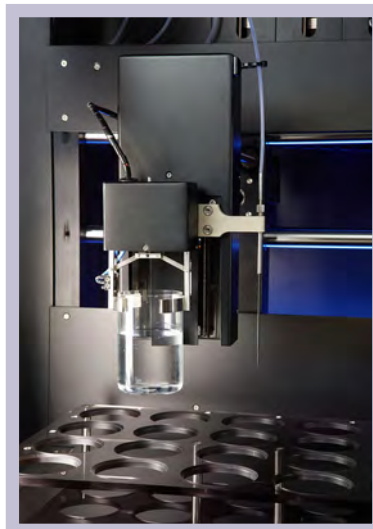


Sirius inForm

Powerful instrument for bio-relevant dissolution and solubility analysis of formulations and dosage forms

Sirius inForm measures the kinetics of dissolution, absorption, controlled supersaturation and precipitation, and accommodates multiple dosage forms and sample types. It provides high quality support for formulation development and reflects industry's growing interest in dissolution to support *in vivo* prediction. Sirius inForm bridges the gap between research-based micro-scale dissolution and the compendial world.



Automation



Sample handling

Use it for

Data to support *in vivo* studies

- Understanding formulation performance under simulated GI conditions
- The quest for IVIVC

Formulation development

- Make formulation decisions earlier with detailed biorelevant data.
- Investigating solubility enhancement
- Characterizing supersaturation and precipitation
- Comparing dissolution rates of salts
- Optimizing a dosage form in terms of the balance between solubility/dissolution and partitioning

A wide range of assays

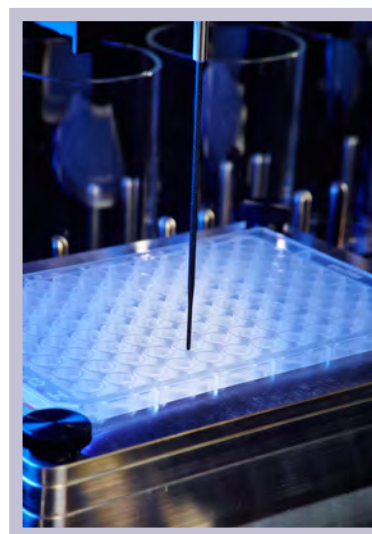
- Dissolution in biorelevant media
- Biphasic dissolution with pH control
- Lipolysis
- Supersaturation, precipitation
- Determination of pH-dependent MECs
- Solubility

Powerful assays - with automation to ensure data quality

Automation and precision engineering ensure that dissolution experiments are well designed and reproducible. Sample handling is automated too, with samples introduced into dissolution media at time zero. Innovative methods such as biphasic dissolution, gradient pH adjustment and the use of FaSSiF and FeSSiF show how a drug is likely to behave *in vivo*. Automation allows rapid turnaround of DOE studies (e.g. dissolution of granules, coated beads) to aid development of manufacturing processes. With features such as AUC determination, a range of dissolution models, F1 and F2 calculation and the ability to combine results of more than one experiment, the software delivers strong analytical capability.

A versatile platform

Sirius inForm is a versatile platform for automated analysis of solutions. It provides temperature control and high quality stirring, pH measurement and control, ability to add sample and reagents automatically, pH-gradient and dilution to simulate gastric emptying, *in-situ* UV measurement and the ability to remove aliquots of sample for *ex-situ* analysis, e.g. by HPLC. UV enhancements include multi-component sensing, and Tyndall-Rayleigh scattering correction to reduce the effect of suspended solids during dissolution studies.



Aliquot dispensing into filter plate for *ex-situ* analysis by HPLC

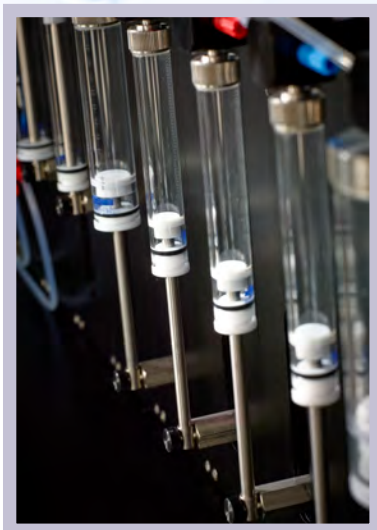


Controlled supersaturation for intestinal precipitation

With many new drugs now requiring solubility enhancement, formulators need ways to characterize supersaturation and precipitation. Sirius inForm measures solubility using the

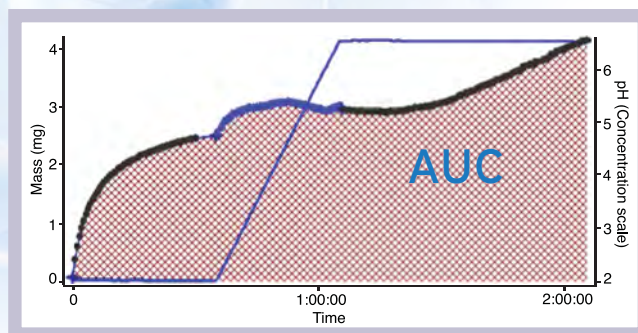
CheqSol* method; new assays report the extent and duration of supersaturation; precipitation rates and excipient gain factors can be derived from the data.

Concentrations can be calculated from measured pH, which eliminates interference by suspended solids. There is also a UV option for controlled supersaturation studies.



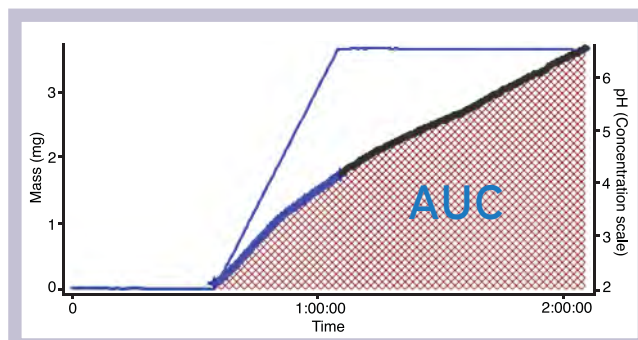
Precision syringes deliver reagents

*US Patent 7,723,119 B2, 2010



Biphasic dissolution with lipid introduced at start of lipid phase.

1. Total drug released into aqueous and lipid phase



2. Drug appearing in lipid

SIRIUS INFORM TECHNICAL SPECIFICATION

pH electrode	Ag/AgCl, double junction reference, standardised by Sirius Four-Plus™.
pH control	pH adjusted in real time. Can create pH profiles that match GI transit including pH gradient.
Electrode storage	Home position for electrode storage and pH 7 buffer position for calibration.
Stirrer	Variable speed (1-900 rpm) for agitation of aqueous layer, with adjustable-height paddle for solvent phase during biphasic assays.
Temperature	Measured by thermocouple at every datapoint. Controlled by Peltier, range 10 °C to 55 °C.
Turbidity detection	Automatic using in-situ UV - through exceeding absorption threshold due to Raleigh scattering at wavelength where compound doesn't absorb.
In situ UV	Two UV dip probes for aqueous and lipid layers. Variable path length for aqueous probe.
Partition solvents	Partition solvents supported include octanol, nonanol, decanol and hexadecane.
CoSolvents	Co-solvents supported include methanol, acetonitrile and dioxane.
Dispensers	7 dispensers for water, titrants, co-solvents, buffers and FaSSiF/FeSSiF. 6-way valve for extra reagents. Multi tip capillaries for titrant delivery.
Robotics	Fully automated x, y and z axis on both arms.
Sampling needle	For removing aliquots from the assay for ex-situ analysis. Also capable of adding liquid samples to the assay vial during measurement.
Sample extraction and filtration	Built in vacuum filtration for a 96 well plate enabling collection of samples for ex-situ analysis.
Excipient vial rack	Excipient rack holds 9x2 mL and 16x4 mL HPLC vials for automated addition of liquid samples including stock solutions, excipients and buffers.
Wash stations	Two static wash positions containing solvent and surfactant one flowing water wash station.
Sample vials	Max. volume 100 mL. 20 vial positions in tray.
Purge gas	All assays performed under inert gas blanket to mitigate CO ₂ contamination.
Assay volume	25 - 100 mLs
Environment	Indoor use only, altitude ≤2000 m, temp. 5 °C to 40 °C, max relative humidity 80% @ 31 °C. Mains voltage fluctuation +/- 10%. One mains power inlet (110 or 240 V), 50-60 Hz. Installation overvoltage Cat II. Pollution degree 2.

SIRIUS INFORM ASSAY SPECIFICATION

Dissolution with Biorelevant media control	<ul style="list-style-type: none"> Automated and flexible pH control including simulation of Gastric pH, gastric emptying (gradient pH change) and intestinal pH Real-time Temperature control, agitation, dilution. FaSSiF/FeSSiF can be introduced Concentration determination through multi-component HHMEC's which are automatically measured by inForm
Biphasic dissolution	<ul style="list-style-type: none"> Biorelevant Dissolution with additional lipid phase added In-situ monitoring of concentration in both phases simultaneously
pH-metric dissolution	<ul style="list-style-type: none"> Measure dissolution kinetics through real-time pH monitoring Useful for ionisable systems Unaffected by turbidity Also supports sampling for ex-situ analysis
Lipolysis	<ul style="list-style-type: none"> Assays to study digestion of lipid-based formulations
Supersaturation & Precipitation modelling	<ul style="list-style-type: none"> Controlled supersaturation through pH shift and solvent quench Measure induction times and precipitation rates
pH dependent Molar Extinction Coefficients	<ul style="list-style-type: none"> Automatically measures Absorption profiles for all species in solution Assess the effect of media ingredients (excipients etc.) on ionization and absorption profiles
Solubility	<ul style="list-style-type: none"> Measure solubility of ionizable drugs Extrapolate a pH-solubility profile
Automated arm to pick and place solid samples	<ul style="list-style-type: none"> Whole dosage forms 3, 6 and 8 mm diameter compacts Powders, granules
Aspiration and dispensing of liquid samples	<ul style="list-style-type: none"> Septum piercing needle Dissolved samples & suspensions Low viscosity lipid based formulations 0 uL - 5 mL aliquots; 2 and 4 mL vial racks
Data processing	<ul style="list-style-type: none"> Multi-wavelength and multi-pH UV calibration Light scattering correction for turbid solutions (including models for Tyndall/Rayleigh scattering) Mass and charge balance analysis by pH Multiple Release models: <ul style="list-style-type: none"> Zero order Noyes-Whitney Weibull Hixson-Crowell (spherical and non-spherical) IDR Integration of the area under the curve (AUC) F1 difference and F2 similarity tests Use for formulation optimisation using DOE Applications for QbB

PHYSICAL DIMENSIONS	WEIGHT	HEIGHT	WIDTH	DEPTH
Instrument	75 kg / 165.35 lbs	800 mm	1500 mm	700 mm

Technical information

We've produced a wealth of materials to help you learn more about Sirius inForm.

They are available at www.sirius-analytical.com.



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