Equipment Standardexperiments

AK Betzel @Geb22a, DESY

Protein Crystallization Systems

Honeybee961

Features
https://www.digilabglobal.com/--HONEYBEE-961--963

Oryx8 with LCP option

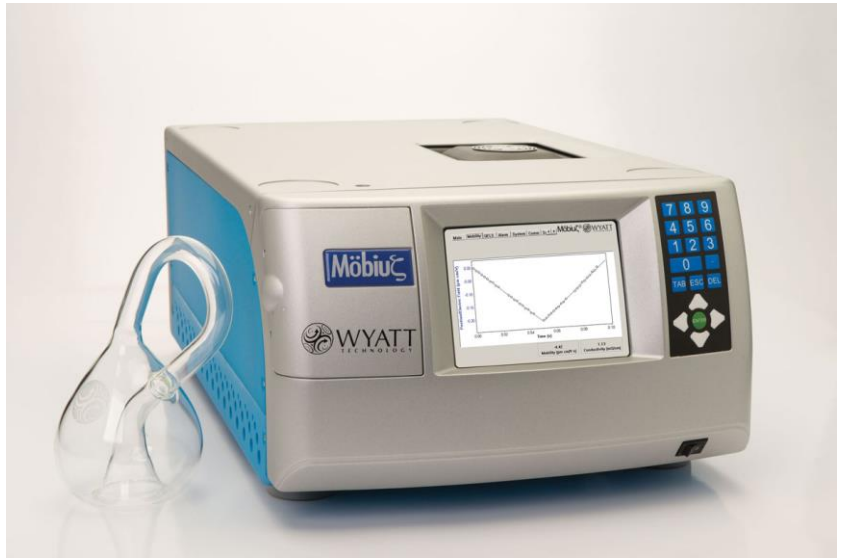
Features:
https://www.douglas.co.uk/oryx8.htm#top

Liquid Handling

LISSY is modular state of the art *liquid handler* robotic system, combining sophisticated and flexible liquid handling with robotic manipulation. The modern, uncomplicated design integrates robotic and liquid handling functionality into a robotic arm, which glides on an x-rail to access racks modules on or off the workbench.

Typical use: Preparation of customized crystallization-screens and masterblocks

Particle characterization with lightscattering (1)

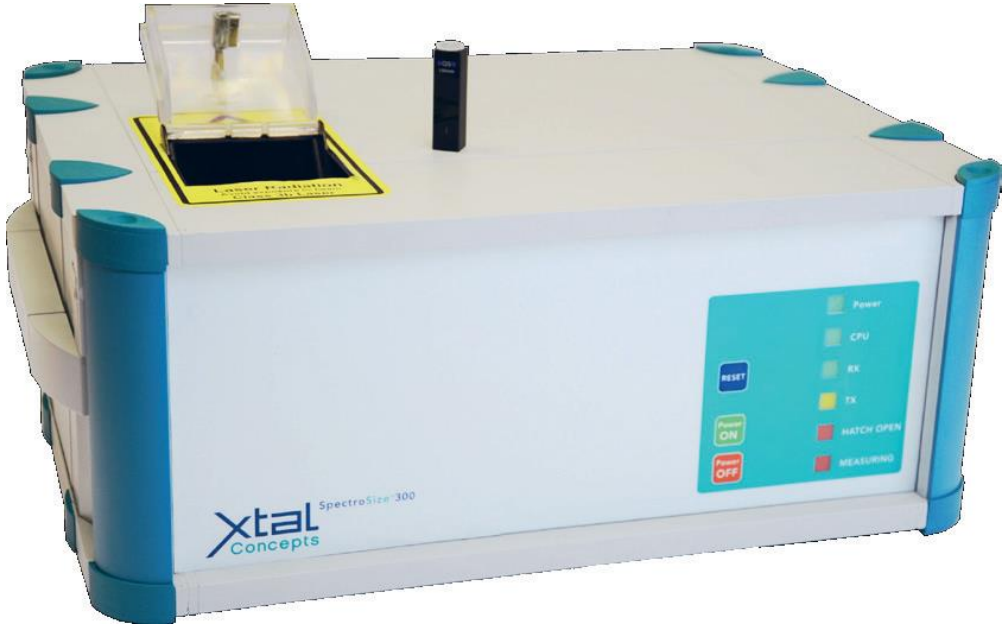


Möbius and Atlas

- Non-destructive analysis of fragile biomolecules
- Repeatable and accurate measurements in conductive buffers such as physiological saline
- Simultaneous measurements of size and mobility
- Automated sample handling or manual measurements
- Fluorescence blocking filter for sizing of fluorescing nanoparticles such as quantum dots

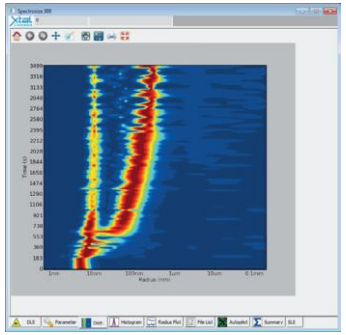
See features:
https://www.wyatt.com/products/instruments/mobius-zeta-potential-detector.html#mobius-9

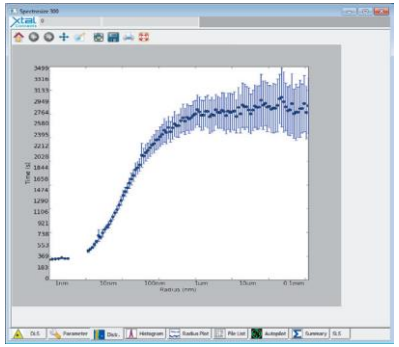
Particle characterization with lightscattering (2)



Spectrosize300

Features:
http://www.xtal-concepts.com/index.php/en/dynamic-light-scattering-devices.html





Particle characterization with lightscattering (3)

NanoSight LM10

The Malvern Panalytical NanoSight LM10 uses the technology of Nanoparticle Tracking Analysis (NTA). This unique technology utilizes the properties of both light scattering and Brownian motion in order to obtain the size distribution and concentration measurement of particles in liquid suspension. A laser beam is passed through the sample chamber, and the particles in suspension in the path of this beam scatter light in such a manner that they can easily be visualized via a 20x magnification microscope onto which is mounted a camera. The camera operates at 30 frames per second (fps), capturing a video file of the particles moving under Brownian motion. The software tracks many particles individually and using the Stokes-Einstein equation calculates their hydrodynamic diameters.

Features:
https://www.malvernpanalytical.com/en/products/product-range/nanosight-range/nanosight-lm10#overview

Advanced Imaging

Leica M205C with FusionOptics

- stereomicroscope with a zoom range of 20.5x
- resolution up to 1050 lp/mm, which corresponds to a resolved structure size of 472nm.

X-ray diffraction

Source: Microfocus IμS 2.0 Cu

https://www.incoatec.de/iμs

Detector: mar345 dtb

https://www.marxperts.com/man/mar345/introduction.html

Temperaturrange: 80-296 K
Alternativly use of an humidity controller:

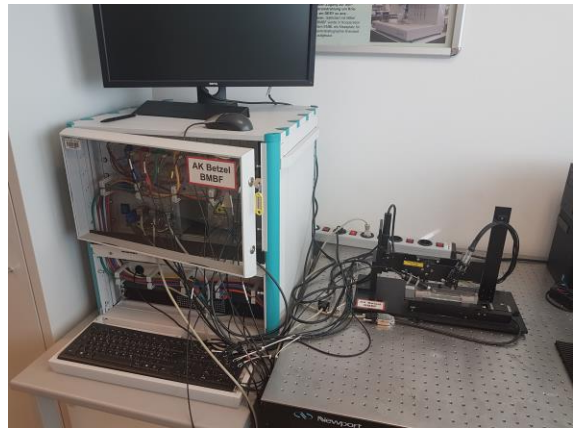
https://www.sablesys.com/products/classic-line/dg-4-dewpoint-generator/

or by a N2-cryostream

Equipment for non-standard experiments (not straight forward use, still in the experimental phase)

- DDLS – deploarized dynamic light scattering technology e.g. identification of nanocrystals in amorphous precipitate

Schubert et al., 2015; Menying et al, 2020



- Multi-channel in situ DLS e.g. monitoring of protein aggregation and liquid dense cluster formation

Falke et al., 2019

- Xtal Controller – for controlled crystalliation experiments

Schubert et al., 2017