Components

CoolSpeK main body	1
Temperature controller	1
Liquid nitrogen reservoir	1

*cuvette is not supplied

Standard accessories

- A silicon tube (phi 5 x phi 9, 3m) 1
- Tube sets for gas flow (urethane tube, connector of taper pipe threads, flow valve)
- Tool kit
- User's manual

Outer size of the CoolSpeK main body (without options)

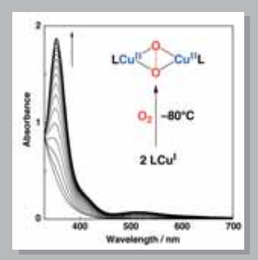
162.5mm (Height) x 90mm (Width) x 111mm (Length)

Specifications

Liquid nitrogen reservoir	: Stainless, 2 Litre
Low-temperature sample chamber	: Aluminum, polyurethane foam for thermal insulation
Optical windows	: Quartz, Three-way
Suitable cell	: Outer dimension of 12.5mm x 12.5mm
Temperature control	: Regulation of liq.N_2 flow
Temperature range	: (standard) -80 degC to room temperature (optional) -80 degC to 100 degC
Volume of Liq.N_2 consumption	: 1Litre/hour
Precision of temperature control	: Plus minus 1 degree or plus minus0.5% of indication value, which is greater (error of the sensor not included)
Quantity of dew condensation	: Less than 0.1OD/hour at -80 degC with Unisoku spectrophotometer
Temperature sensor	: Resistance thermometer sensor (Pt-100 Class B)
Functions	: There are two built-in heaters in the main body. One is for prevention of dew condensation on optical windows. Another is for temperature control.
System electronics	: AC100V 1A (Transformer will be provided accordance with the voltage of each countries.)
Cryogen used	: Liquid nitrogen

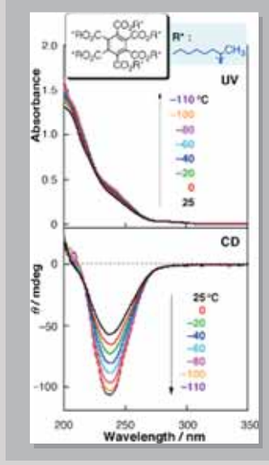
Application Examples

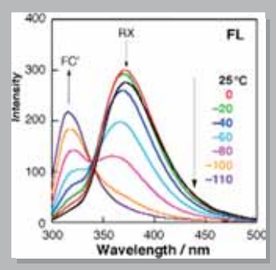
Time-dependent UV-vis Spectra



Spectral changes for the reaction of O_2 and a Cu(I) complex at -80 degC. Formation of a m- peroxo dinuclear copper(II) complex can be easily monitored by the time-dependent UV-vis spectrum at low temperature. (Courtesy of Prof. Shinobu Itoh of Osaka University)

Variable-temperature UV-vis, CD, and fluorescence spectra





Valuable-temperature UV-vis, circular dichroism, and fluorescence spectra of (*R*)-1-methylheptyl mellitate (0.03 mM) in pentane at 25 degC to -110 degC. FL; Excitation at 270 nm.
(Courtesy of Prof. Yoshihisa Inoue of Osaka University and Prof. Takehiko Wada of Tohoku University)

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Acknowledgement:These instrument components are subject to change without prior notice for improvement in performance.

K20111001E

UNISOKU Scientific Instruments

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Cryostat for Spectrophotometer

CoolSpeK UV/CD

USP-203-B/USP-203CD-B

For UV-Vis spectrophotometers
CoolSpeK UV USP-203-B

For Circular Dichroism (CD) spectrophotometers
CoolSpeK CD USP-203CD-B

- User-friendly
- -80 degC to +100 degC in units of 0.1 degC
- Striking performance with liquid solution
- Kinetics
- Light weight and compact footprint

This cryostat CoolSpeK enables you to easily obtain spectra and chemical kinetics rates under low-temperature condition.

CoolSpeK is attached to a sample compartment of commercial UV-Vis or fluorescence spectrophotometers by using an adaptor.
Various kinds of options are supplied for customer's requirements.

Features

Chemical kinetics

CoolSpek is able to measure a chemical reaction process by injecting a reagent and using a magnetic stirrer (Option).

User-friendly

CoolSpeK doesn't require vacuum pumps, and can be used at atmospheric pressure. This equipment cools your sample to low temperature by flowing liquid N_2 from a reservoir, and controls the temperature precisely by auto regulating of the flow.

Low dew condensation

Special structure and heating function prevent dew condensation.
*Quantity of dew condensation: Less than 0.05OD/hour at -80 degC with Unisoku spectrophotometer, after heat treatment.

Temperature range -80 degC~ room temperature ~ 100 degC

(Standard) -80 degC ~ room temperature
(Optional) -80 degC ~ 100 degC

Extensive customer base

Over 100 sets were already shipped globally.

Light weight and compact footprint

CoolSpeK main body is compact and it can be placed inside of sample compartments of commercial UV-Vis or fluorescence spectrophotometers by using adapters. Cuvettes with cap for spectrophotometers can be used for this cryostat.
* The lid of sample compartments in some spectrophotometers may not be shut when is attached the cryostat.

Variety of Options

There are a lot of options. Magnetic stirrer, high temperature control, various base adaptors, cuvette adaptor, solid sample holder, and so on.

Systems interfaceble with USP-203-A

Unisoku Stopped-flow Rapid-scan RSP-1000
Agilent 8453-Series Diode Array Spectrophotometer
Beckman DU-7400 Spectrophotometer
Edinburgh Instruments Fluorescence Spectrometer
JASCO Spectrophotometer V-550/560/570 V-650/660/670
JASCO Fluorescence Spectrophotometer FP-6500
JASCO Circular Dichroism Dispersion Measurement System J-720/820
Hewlett-Packard HP8453-Series Diode Array Spectrophotometer
Hitachi Spectrophotometer U-3500
Hitachi Fluorescence Spectrophotometer F-4500
Shimadzu Spectrophotometer UV-3000/3150/3600
Shimadzu Spectrophotometer UV-2400/2450/2550
Shimadzu Fluorescence Spectrophotometer RF-5300*(1)
Varian Spectrophotometer Cary50
* In some spectrophotometers, room light may get into detectors when the cryostat is attached.
*Please contact us if your spectrophotometer is not listed above.
*(1)Magnetic stirrer(No.CS-ST) can not be installed for RF-5300.

OPTION

Magnetic stirrer (No.CS-ST)

This is attached on the bottom of CoolSpeK main body.
The spin speed is controlled by the controller.
* This magnetic stirrer cannot be attached with some spectrophotometers.

High temperature control (No.CS-HT)

This controls the temperature from room temperature to 100 deg C

Standard Cuvette (No.CS-CL-U1)

Four-side transparent quartz cuvette with a screw cap
(light path length: 10mm)

Magnetic stirring bar (No.CS-SB)

This is used in the Standard Cuvette (No.CS-CL-U1).
Specified Tolerance of Teflon© Walls
High Strength Magnetization

Adaptor for 1 mm light path length cell (No.CS-CL-H1)

This adaptor fills a gap between the cuvette and the cryostat internal body.
A spring in the adaptor makes thermal conduction better.
Adapter for 2 mm light path length cuvette is also available.
* Don't include curette

Adaptor for 1 mm light path length cuvette (for fluoresence) (No.CS-CL-F1)

This adaptor enables you to acquire the surface fluorescence of samples with high absorption in 1mm light path length cuvette. * Don't include curette

Solid sample holder (for transmittance) (No.CS-KT-H5-15)

Suitable sample:a solid sheet or powder
Suitable dimension:phi 10mm or 10mmx10mm, Thickness:0.5-1.5mm
Please contact us if your sample dimension is different from above.

Solid sample holder (for fluorescence) (No.CS-KF-H5-27)

Suitable sample: solid sheet or powder
Suitable dimension:13mmx13mm, Thickness:0.5-2.5mm
Please contact us if your sample dimension is different from above.