UnispeKs

Components

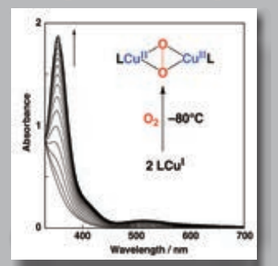
CoolSpeK main body	1	**Standard Accessories**
Temperature Controller	1	1 Silicon Tube (ID 5mm x OD 9mm x 3 Meters)
Liquid Nitrogen Reservoir	1	Set of Tubes for Gas Flow
*Cuvette is not supplied		(urethane tube, connector of taper pipe threads, flow valve)
		Tool Kit
		User's Manual
		Outer Size of the main body (without options)
		146.5mm(H) x 90mm(W) x 111mm(D)

Specifications

Liquid Nitrogen Reservoir	Stainless, 2L
Low-Temperature Sample Chamber	Aluminium, polyurethane foam for thermal insulation
Optical Windows	Quartz, 3-way
Suitable Cell	Outer dimension 12.5mm x 12.5mm
Temperature Control	Regulated liq. N_2 flow
Temperature Range	-80℃ to +100℃
Volume of Liq. N_2 Consumption	1L / hour
Precision of Temperature Control	±1℃ or ±0.5% of indication value, whichever is greater (error of the sensor not included)
Quantity of Dew Condensation	Less than 0.1OD / hour at -80℃ with UNISOKU spectrophotometer
Temperature Sensor	Resistance thermometer sensor (Pt-100 Class B)
Functions	2 built-in heaters in the main body
	One for prevention of dew condensation on optical windows. Another for temperature control.
Cryogen Used	Liquid Nitrogen

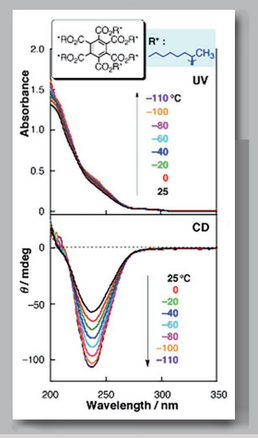
Application Examples

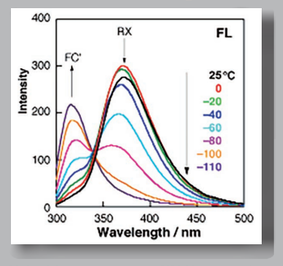
Time-dependent UV-Vis Spectra



Spectral changes for the reaction of O_2 and a Cu (I) complex at -80℃. 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 (0.03mM) in pentane at 25℃ to -110℃.
FL: Excitation at 270nm.

(Courtesy of Prof. Yoshihisa Inoue of Osaka University and Prof. Takehiko Wada of Tohoku University)

*Instrument components are subject to change without prior notice for improvement in performance.

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UnispeKs

Cryostat for Spectrophotometer
CoolSpeK UV/CD

USP-203 Series

For UV-Vis spectrophotometers
CoolSpeK UV USP-203

For Circular Dichroism (CD) Spectrophotometers
CoolSpeK CD USP-203CD

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

CoolSpeK allows you to obtain spectra and chemical kinetic rates under low-temperature condition easily.

CoolSpeK is attached to a sample compartment of commercial
UV-Vis or fluorescence spectrophotometers by using an adaptor.
Various kinds of options are prepared to meet customers requests.

Features

Chemical Kinetics

CoolSpeK is able to measure a chemical reaction process
by injectioning a reagent and using a magnetic stirrer (option).

User friendly

CoolSpeK does not require vacuum pumps, and can be used in atmospheric pressure.
It cools the sample to low temperature by flowing liquid N2 from a reservoir,
and controls the temperature precisely by auto-regulating the flow.

Low Dew Condensation

Special structure and heating function prevent dew condensation: Less than 0.05OD / hour at
-80°C with UNISOKU spectrophotometer, after heat treatment.

Temperature Range

-80°C ~ Room Temperature ~ +100°C

Extensive Customer Base

Shipped over 500 sets globally (2022)

Light Weight and Compact Footprint

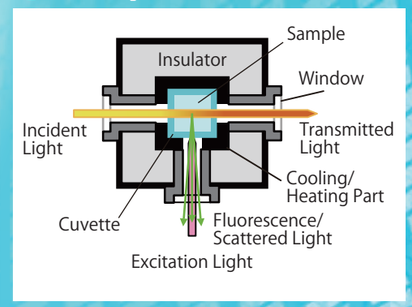
CoolSpeK is compact and can be placed inside the sample compartments of commercial UV-Vis or fluorescence spectrophotometers by using adapters. Cuvettes with cap for spectrophotometers can be used for this cryostat.

*The lid of sample compartments in some spectrophotometers may not close when the cryostat is attached.

Variety of Options

There are plenty of options. Magnetic stirrer, various base adaptors, cuvette adaptor, solid sample holder, and so on.

Example of Use



Installation Example

OPTIONS

Magnetic Stirrer (No. CS-AT-SM)

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

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-F27)

This is used in the Standard Cuvette (No. CS-CL-U1).
Specified Tolerance of Teflon® Walls
High Strength Magnetization (ϕ2mm x 7mm)

Adaptor for 1mm Light Path Length Cell (No. CS-CL-H1)
Adaptor for 2mm Light Path Length Cell (No. CS-CL-H2)

This adaptor fills a gap between the cuvette and the
cryostat internal body.
A spring in the adaptor makes thermal conduction better.
*Does not include cuvette

Adaptor for 1mm Light Path Length Cuvette for Fluorescence (No. CS-CL-F1)

This adaptor enables you to aquire the surface
fluorescence of samples with high absorption in
1mm light path length cuvette.

*Does not include cuvette

Solid Sample Holder for Transmittance (No. CS-KT-H00-32 or H07-42)

Suitable sample: solid sheet or powder
Suitable dimension: ϕ10mm or 10mm x 10mm,
Thickness: 0 ~ 3.2mm or 0.7 ~ 4.2mm

*Does not include cuvette
*Please contact us if your sample dimension differs from above.

Solid Sample Holder for Fluorescence (No. CS-KF-H00-32 or H07-42)

Suitable sample: solid sheet or powder
Suitable dimension: ϕ13mm x 13mm,
Thickness: 0 ~ 3.2mm or 0.7 ~ 4.2mm

*Please contact us if your sample dimension differs from above.

Systems Interfaceable with CoolSpeK UV

UNISOKU RSP-1000/TSP-1000
Agilent Technologies Agilent (Cary) 8453 / 8454
Agilent Technologies Cary 50/60
Agilent Technologies Cary 3500 Flexible Module
(Cary 3500 Compact / Multicell not available)
Agilent Technologies Cary 4000 / 5000 / 6000
Beckman DU-7400
JASCO V-500/600/700 Series
JASCO FP-6000/8000 Series
JASCO J-720/820/1500
Hitachi U-2000/3000/4000 Series
Hitachi F-4500/7000
Horiba FluoroMax/Log
Horiba FluoroCube
Perkin Elmer Lambda Series
Shimadzu UV1800/2000/3000 series
Shimadzu RF-5300/6000
Sinco S-3100
Edinburgh Instruments FLS920 / FLS1000
Edinburgh Instruments LP980(TAS)
※ FLS adaptor "product code F-5376" manufactured by EI separately required

*Some spectrophotometers might not be able to shut out the room light completely when the cryostat is attached.
*Please contact us if your spectrophotometer is not listed here.