UNISOKU
SCIENTIFIC INSTRUMENTS
TII Group

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 N_2 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℃ with UNISOKU spectrophotometer, after heat treatment.

Temperature Range

-80℃ ~ Room Temperature ~ +100℃

Extensive Customer Base

Shipped over 270 sets globally (August 2014)

Light Weight and Compact Footprint

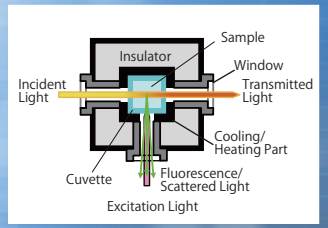
CoolSpeK is compact and can be placed inside the sample compartments of commercial UV-Vis or fluorescence spectrophotometers by using adapters. Cuvettes with cap for spectrophotometers can be used for this cryostat.

*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.

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

Standard Cuvette (No. CS-CL-U1)

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

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

Suitable sample: solid sheet or powder
Suitable dimension: ϕ 10mm 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.

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

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

Suitable sample: solid sheet or powder
Suitable dimension: ϕ 13mm 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 Agilent8453/Cary 8454
Agilent Technologies CARY50/60
Beckman DU-7400
JASCO V-550/560/570/ V-650/660/670
JASCO FP-6200/6500/6600/8000
JASCO J-720/820
Hitachi U-2800/2900/3500
Hitachi F-4500/7000

Horiba FluoroMax/Log
Horiba FluoroCube
Perkin Elmer Lambda Series
Shimadzu UV1800/2000/3000 series
Shimadzu UV2400/2450/2550
Shimadzu RF-5300
Sinco S-3100

*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.

Components

CoolSpeK main body	1
Temperature Controller	1
Liquid Nitrogen Reservoir	1

*Cuvette is not supplied

Standard Accessories

1 Silicon Tube (ϕ 5 x 9 3m)
Set of Tubes for Gas Flow
(urethane tube, connector of taper pipe threads, flow valve)
Tool Kit
User's Manual

Outer Size of the main body (without options)

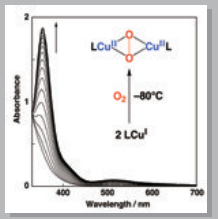
146.5mm(H) x 90mm(W) x 111mm(D)

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.
System Electronics	AC100 ~ 120V 1A 50/60Hz (Transformer will be provided according to the voltage of destination country.)
Cryogen Used	Liquid Nitrogen

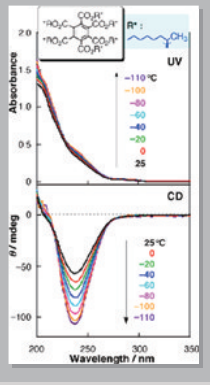
Application Examples

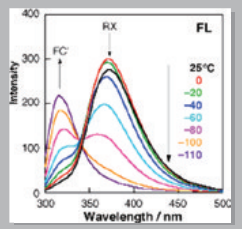
Time-dependent UV-Vis Spectra



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

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