



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Thailand

Description

Shape: Round

Weight: 28.15 ct

Dimensions: 16.77 x 17.14 x 11.16 mm

Diaphaneity: Transparent

Color: Medium dark, moderately strong, slightly greenish Blue

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.68

Pleochroism: Colorless / Blue

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

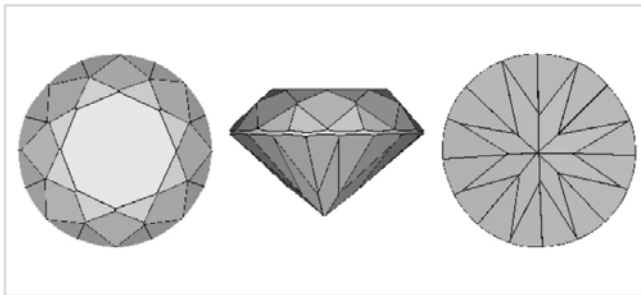
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

Broad absorption below 420 nm; lines at about 543, 596, and 660 nm



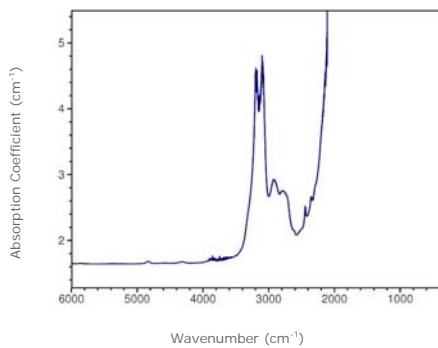
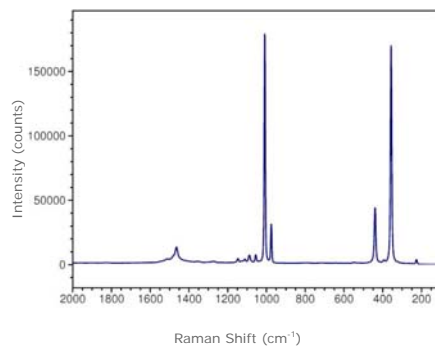
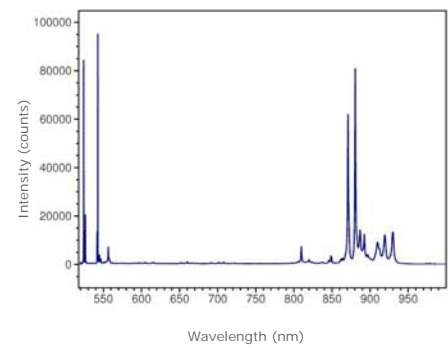
Facet Diagram: top | side | bottom

Photomicrograph

No significant internal features noted



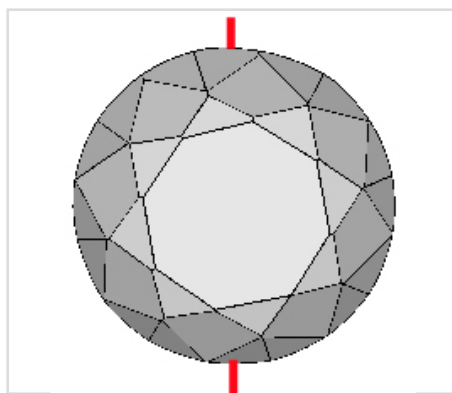
© GIA. Photo by Robert Weldon.

Spectrum
Infrared Absorption

Raman | baseline corrected | 514.5 nm laser

Photoluminescence | 514.5 nm laser


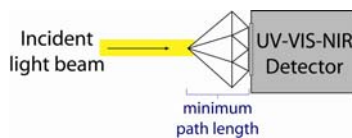
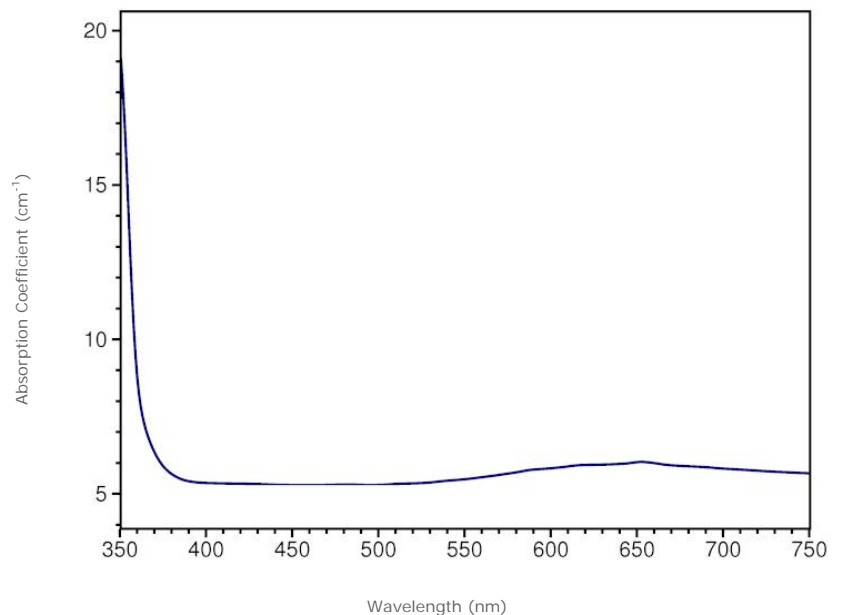
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis

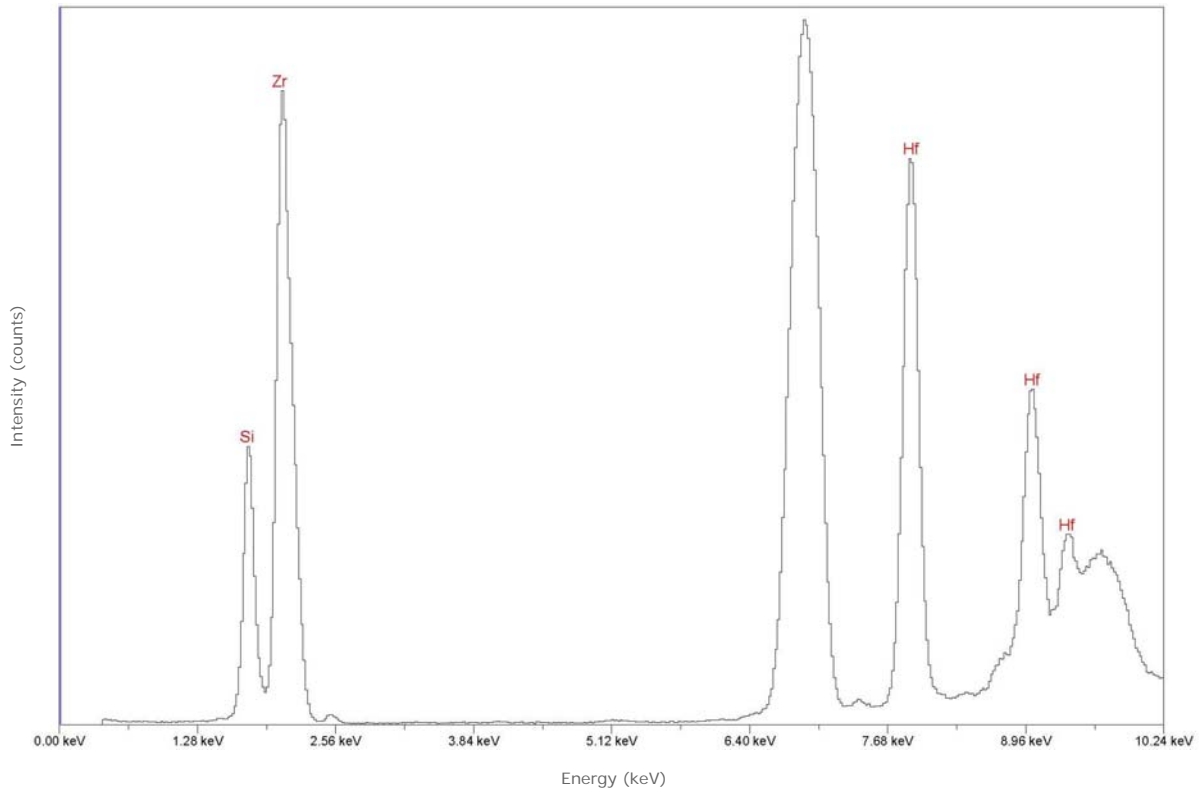

Visible Absorption | min. path length: 11.2 mm


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



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Chemistry | EDXRF



Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium ($Z=11$) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Sri Lanka, Sabaragamuwa Province*Description*

Shape: Oval

Weight: 7.11 ct

Dimensions: 12.91 x 9.42 x 6.64 mm

Diaphaneity: Transparent

Color: Medium dark, moderately strong, yellowish Green

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.07

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

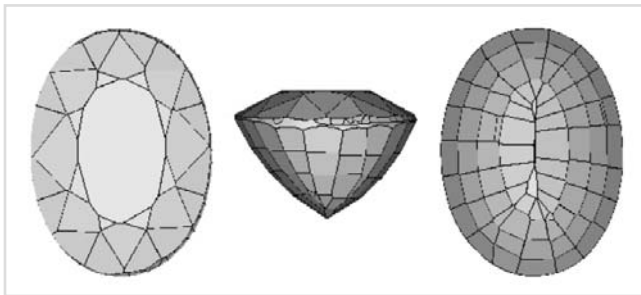
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

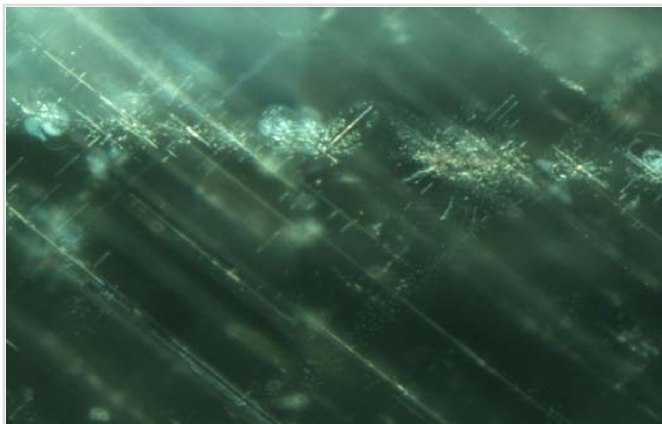
Broad absorption below 430 and above 660 nm; line at 520 nm



Facet Diagram: top | side | bottom

Photomicrograph

This partly metamict green zircon exhibits numerous lines, planes and fractures that are the result of radiation-caused structural damage.



These lines, planes and fractures are the result of radiation-caused structural damage. The field of view is 1.45 mm across.

Magnification: 60x

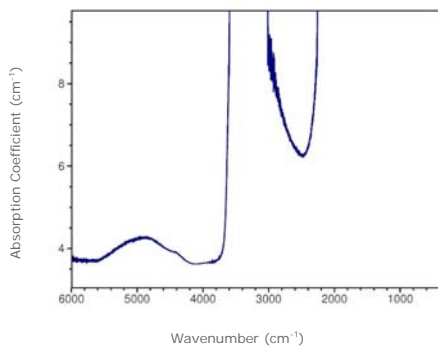
© GIA. Photomicrograph by John Koivula.



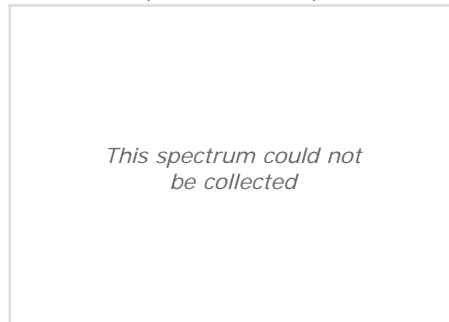
© GIA. Photo by Robert Weldon.

Spectrum

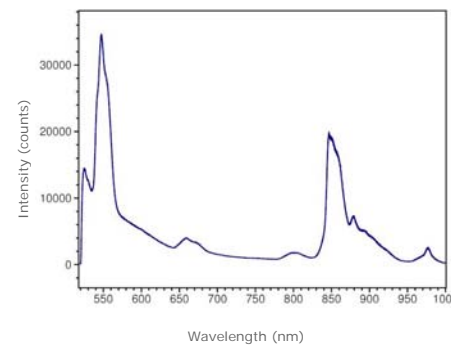
Infrared Absorption



Raman | baseline corrected | 514.5 nm laser



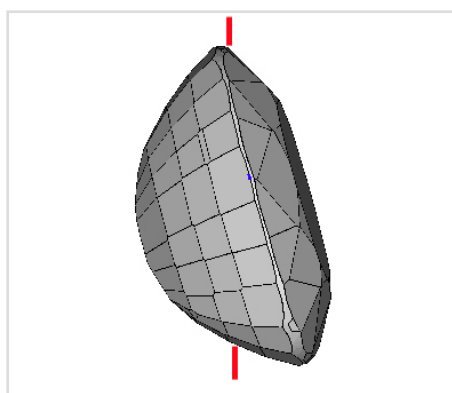
Photoluminescence | 514.5 nm laser



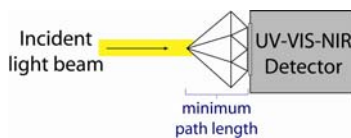
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

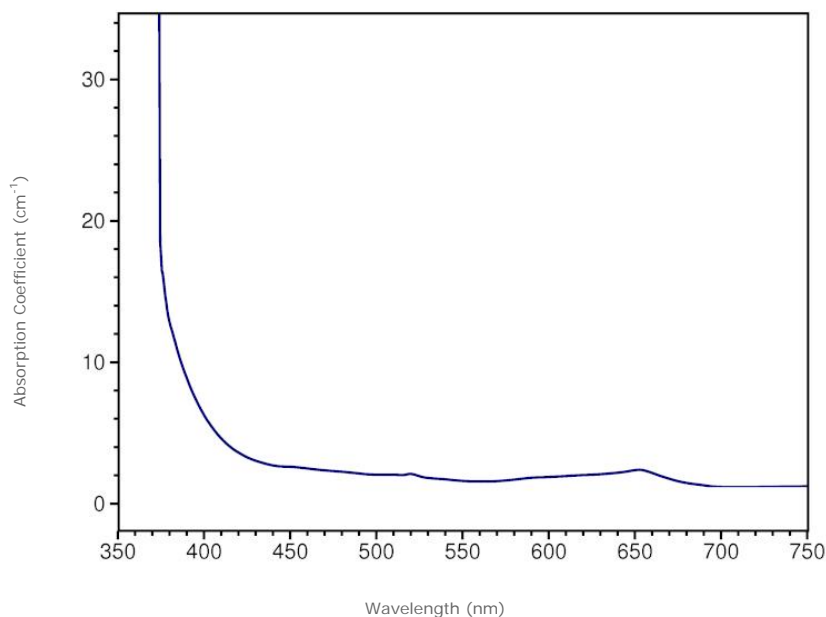
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 6.6 mm

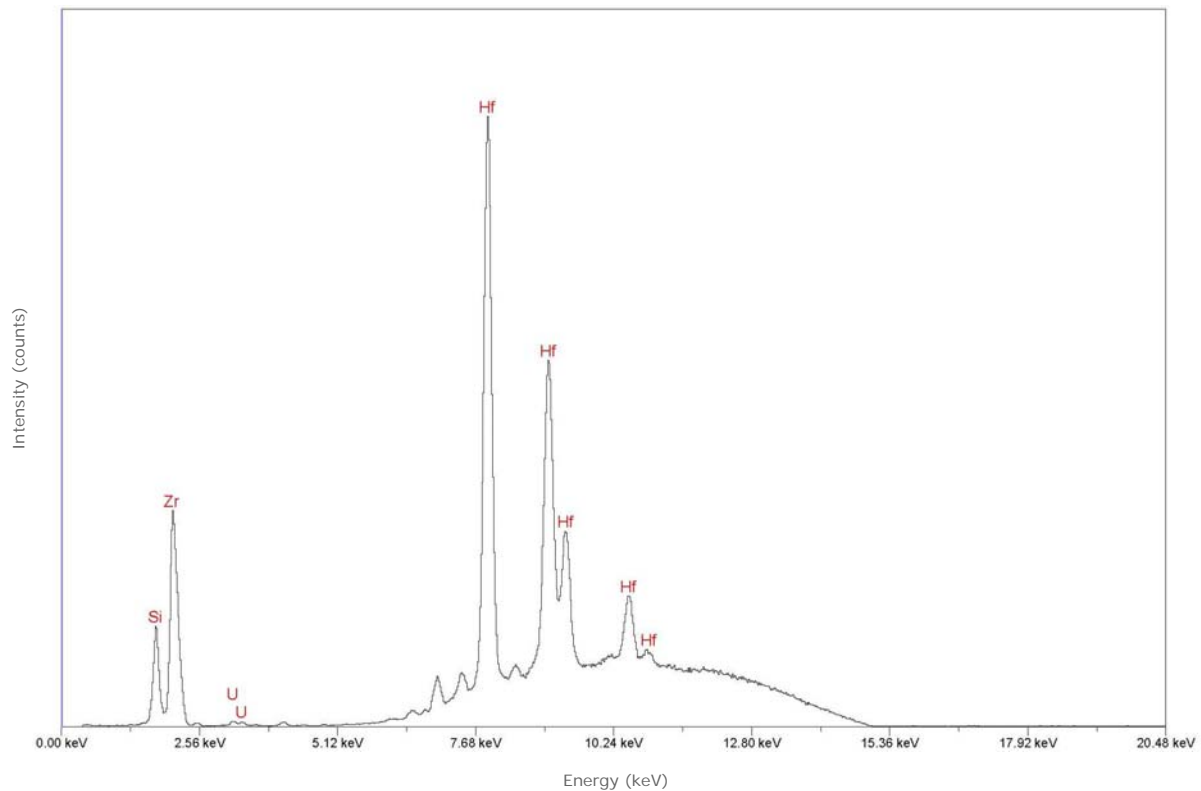


Transmission absorption spectra in the UV to near-IR range (250–1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



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Chemistry | EDXRF



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Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

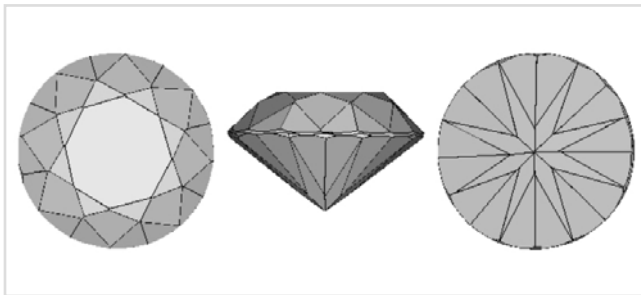
Thailand

Description

Shape: Round
Weight: 11.48 ct
Dimensions: 12.93 x 13.14 x 7.84 mm
Diaphaneity: Transparent
Color: Light, very slightly brownish, yellowish Orange

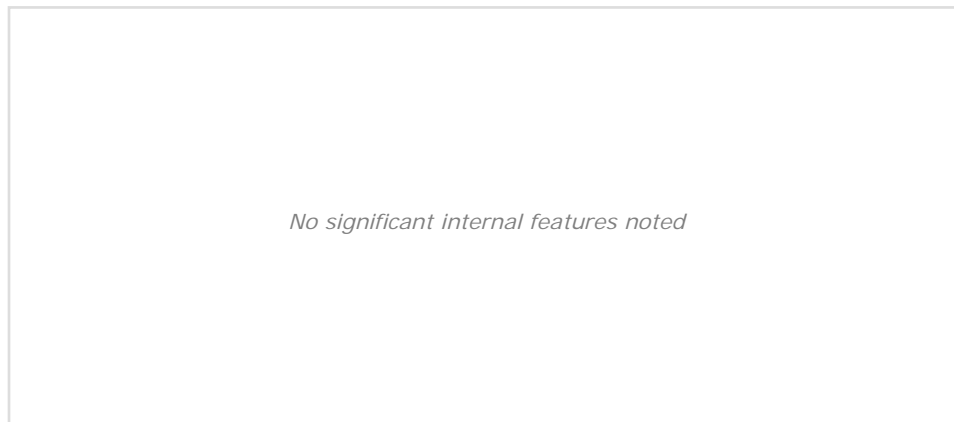
Gemological Properties

Optical Character: Uniaxial positive
Refractive Index: Over the limit
Birefringence: Not calculated
Specific Gravity: 4.70
Pleochroism: None
Luster: Vitreous
Phenomenon: None
Fluorescence:
 LWUV: Weak orangy yellow with even distribution
 SWUV: Weak greenish blue with uneven distribution
Phosphorescence:
 LWUV: None
 SWUV: None
Absorption Spectrum:
 Broad absorption above 670 nm; lines at 485, 518, 539, 562, 589, 615, 653, and 657 nm



Facet Diagram: top | side | bottom

Photomicrograph

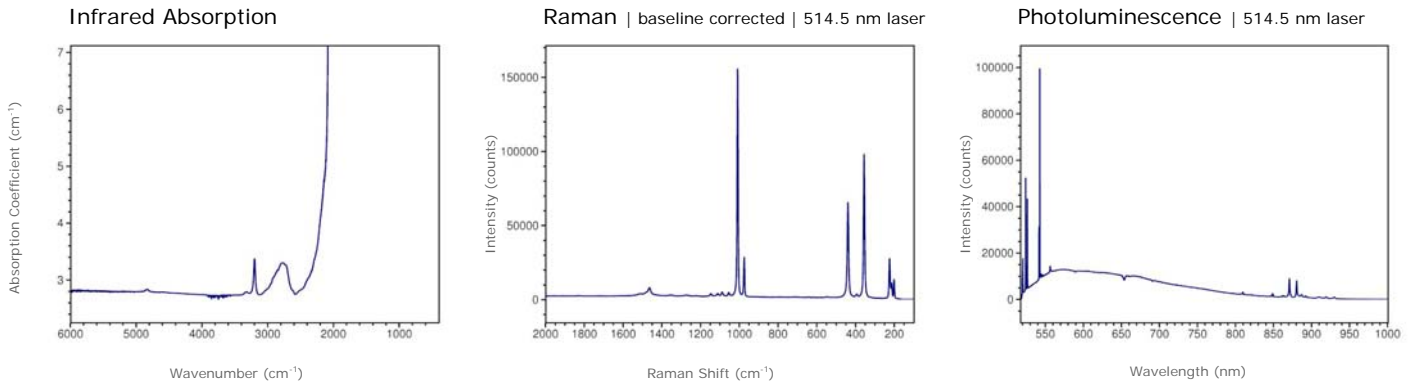


No significant internal features noted



© GIA. Photo by Robert Weldon.

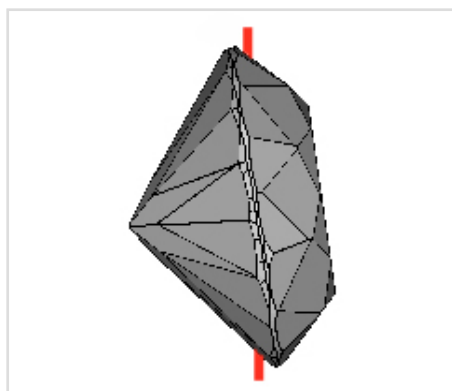
Spectrum



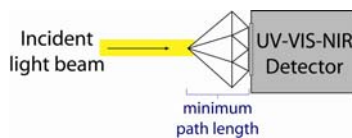
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm⁻¹) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm⁻¹ resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm⁻¹ Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

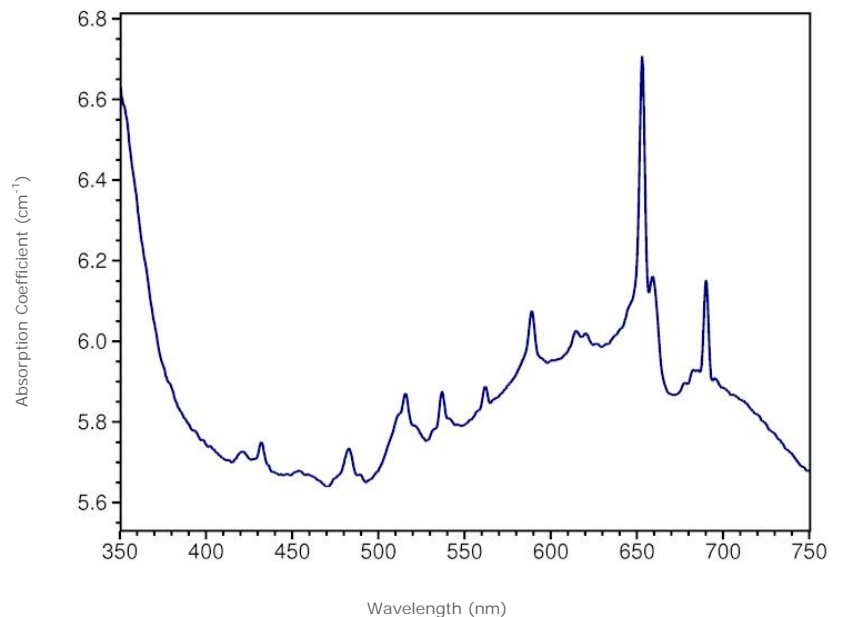
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 7.8 mm

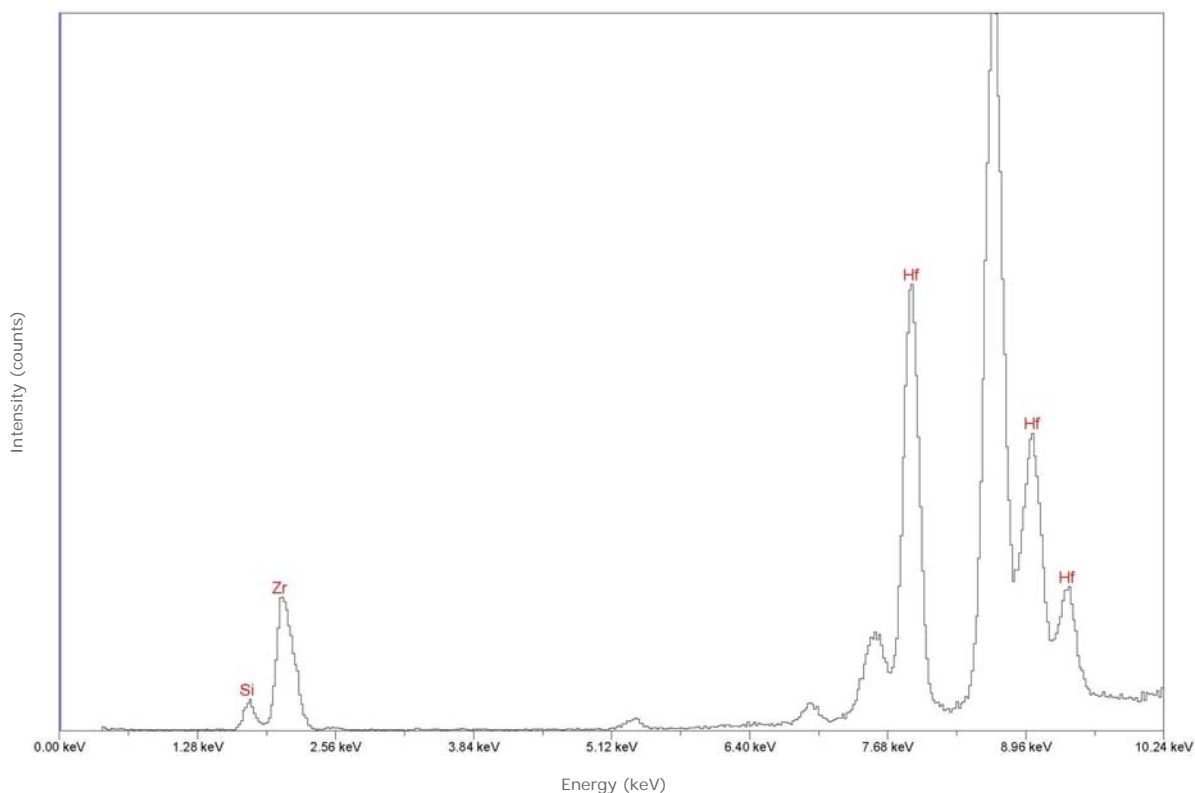


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



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Chemistry | EDXRF



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Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Cambodia

Description

Shape: Rectangle

Weight: 6.61 ct

Dimensions: 11.90 x 8.65 x 5.27 mm

Diaphaneity: Transparent

Color: Medium dark, strong, reddish Orange

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.79

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

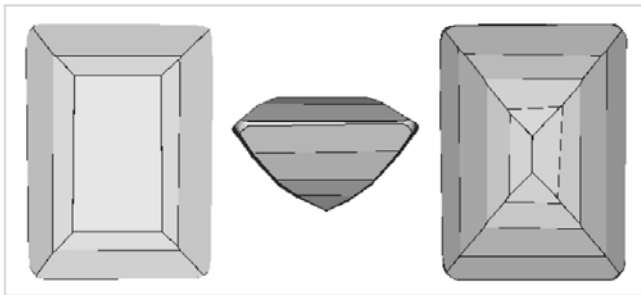
Phosphorescence:

LWUV: None

SWUV: None

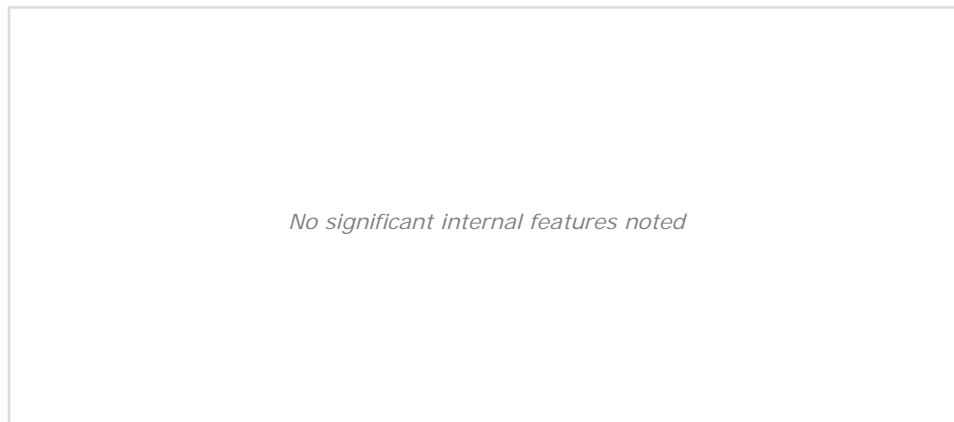
Absorption Spectrum:

Broad absorption below 430 and above 670 nm



Facet Diagram: top | side | bottom

Photomicrograph

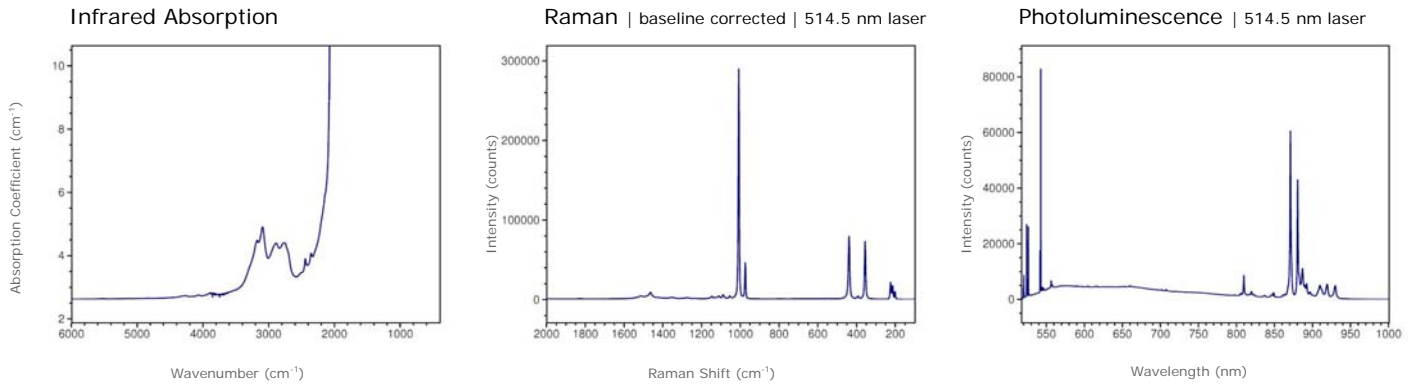


No significant internal features noted



© GIA. Photo by Robert Weldon.

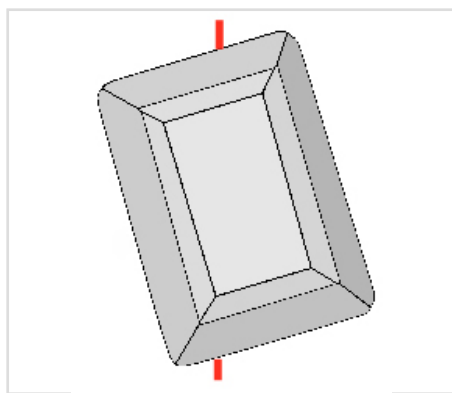
Spectrum



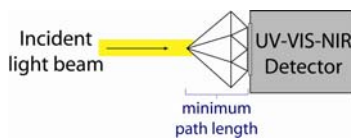
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm⁻¹) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm⁻¹ resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm⁻¹ Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

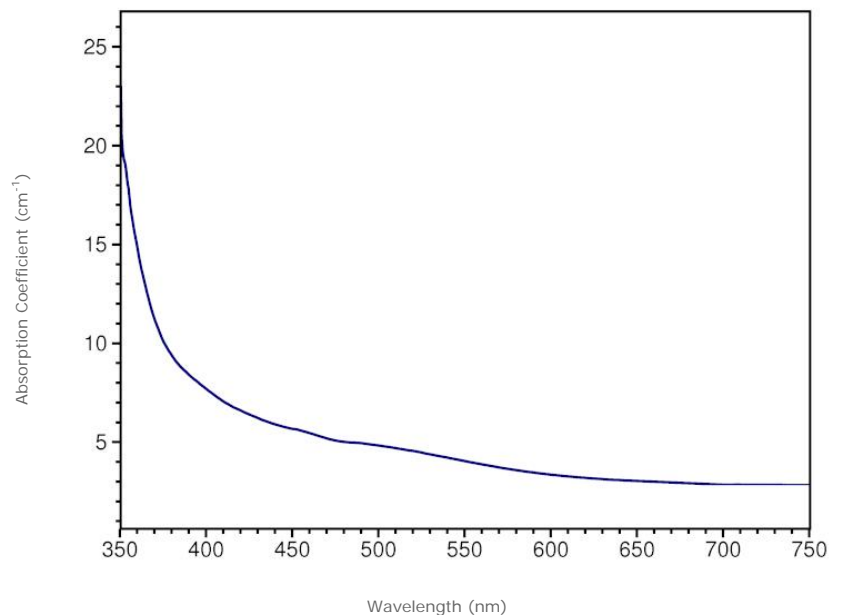
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 5.3 mm

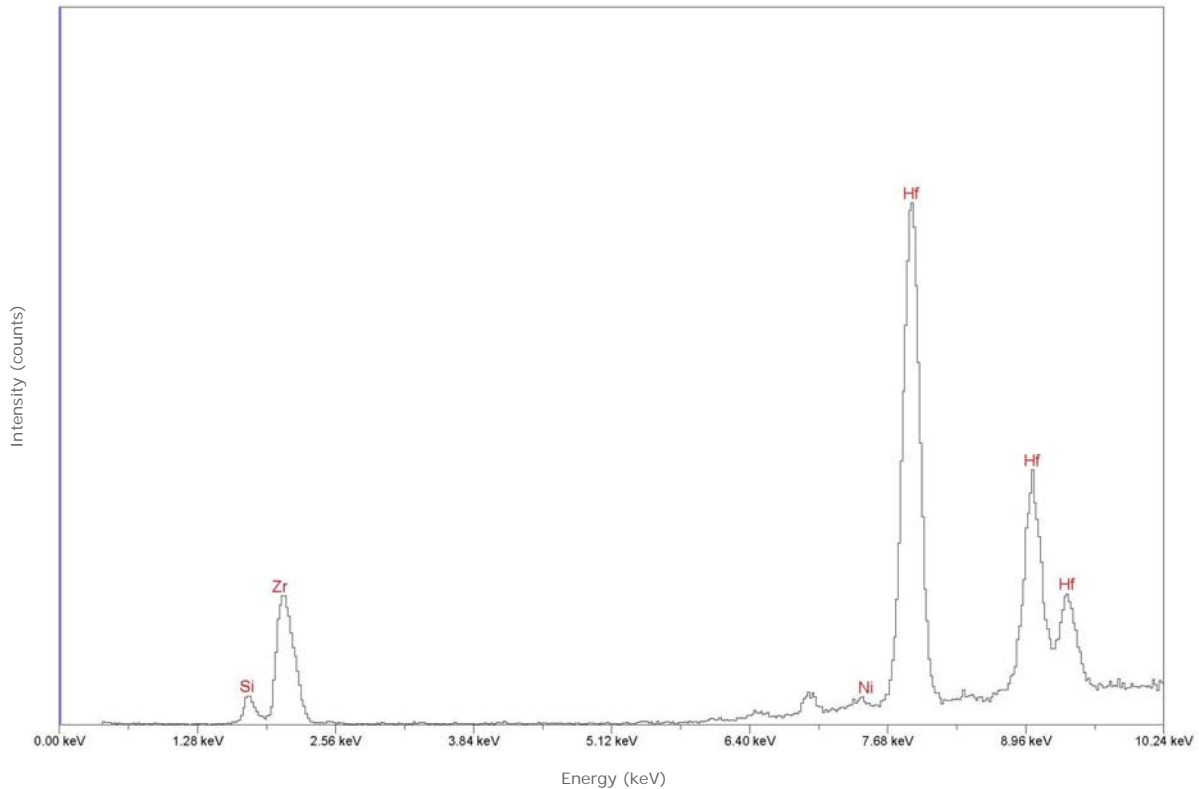


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF



Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium (Z=11) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



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Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Sri Lanka, Sabaragamuwa Province

Description

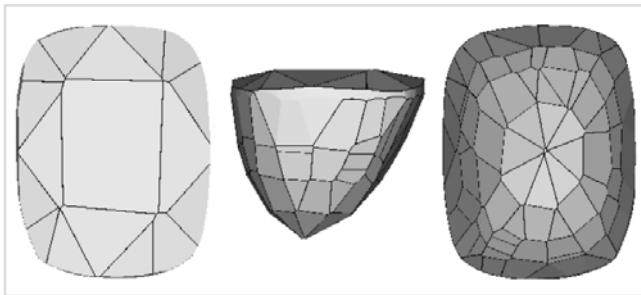
Shape: Cushion

Weight: 6.21 ct

Dimensions: 10.63 x 8.12 x 7.07 mm

Diaphaneity: Transparent

Color: Medium light, very slightly grayish, slightly yellowish Green



Facet Diagram: top | side | bottom

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.12

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

Phosphorescence:

LWUV: None

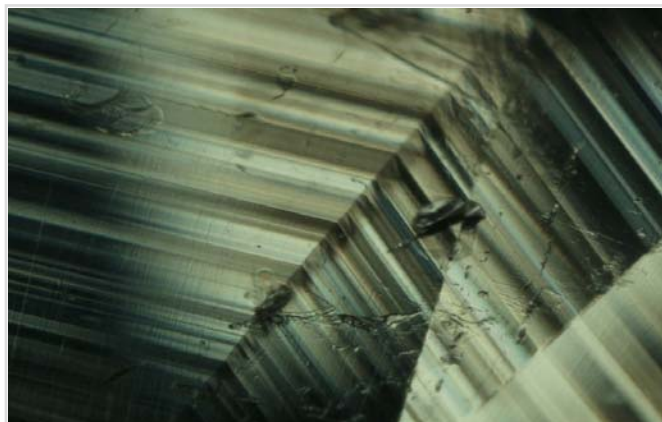
SWUV: None

Absorption Spectrum:

Broad absorption below 430 nm; lines at 485, 518, 539, 589, and 653 nm

Photomicrograph

This green zircon displays growth zoning, solid inclusions, and several healed fractures.



An intersecting pattern of parallel growth zoning. The field of view is 1.75 mm across.

Magnification: 50x

© GIA. Photomicrograph by John Koivula.

GIA Gem Database | Edward J. Gübelin Collection

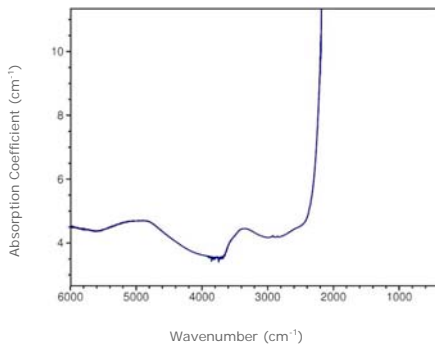
Zircon | Sri Lanka, Sabaragamuwa Province
GIA Collection Number: 33734



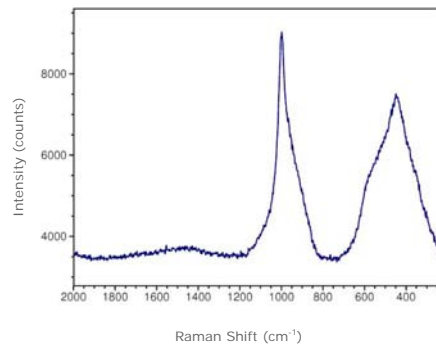
© GIA. Photo by Robert Weldon.

Spectrum

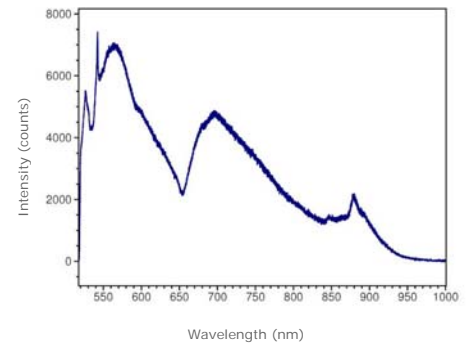
Infrared Absorption



Raman | baseline corrected | 514.5 nm laser



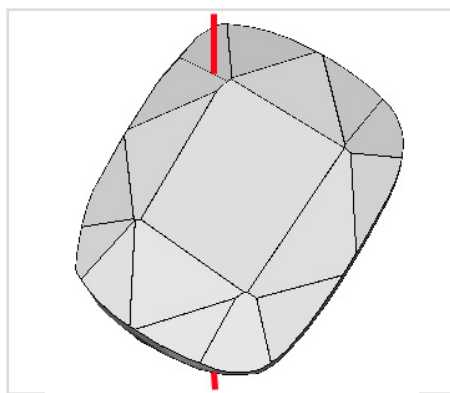
Photoluminescence | 514.5 nm laser



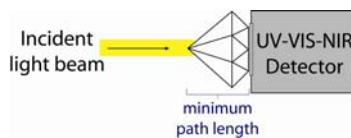
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

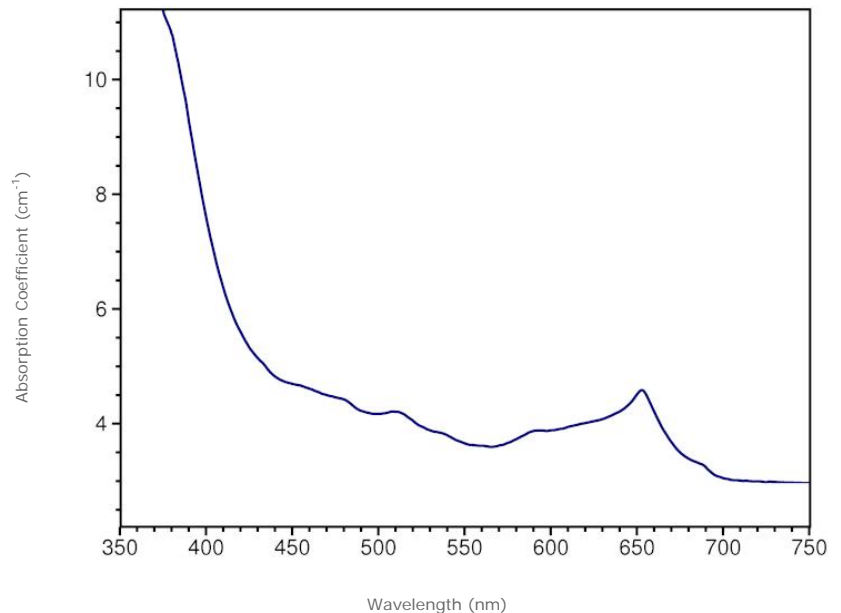
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 7.1 mm

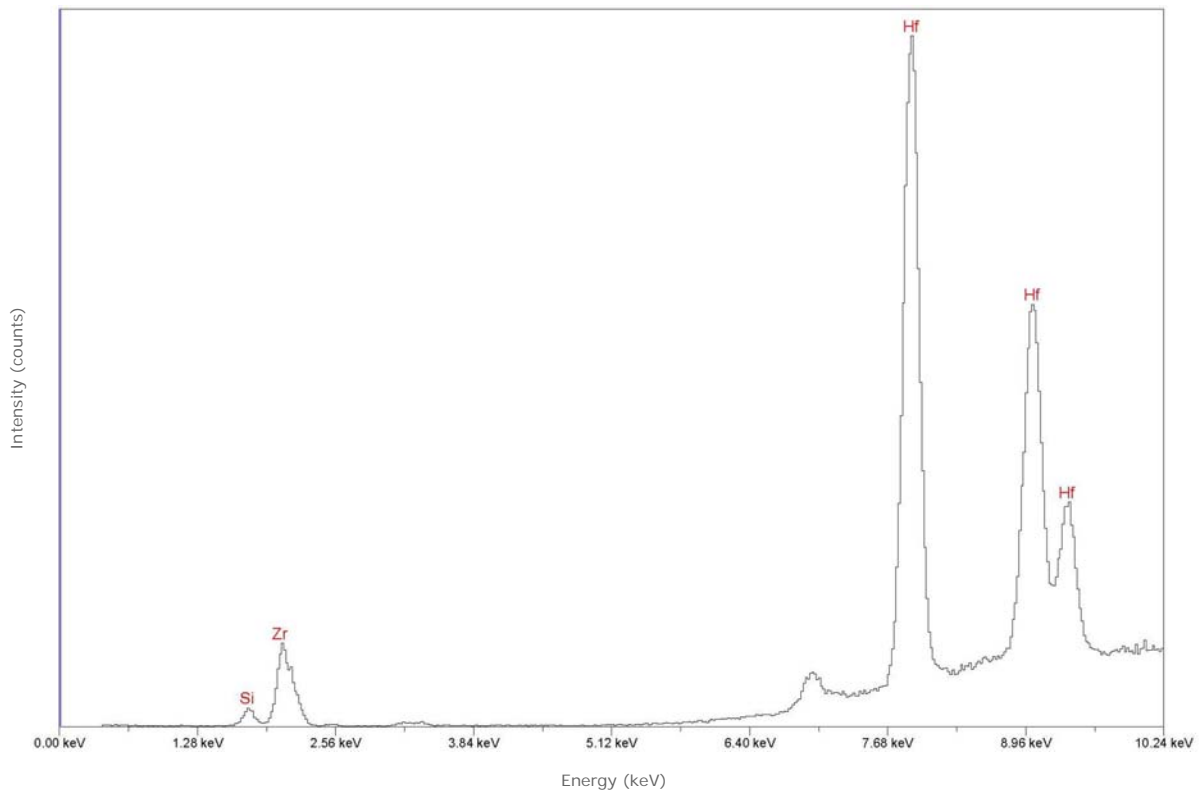


Transmission absorption spectra in the UV to near-IR range (250–1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



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Chemistry | EDXRF



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© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

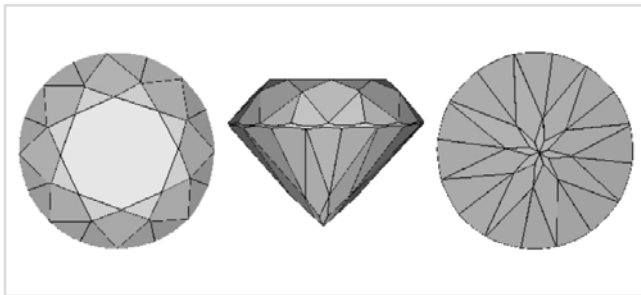
Thailand

Description

Shape: Round
Weight: 19.31 ct
Dimensions: 14.40 x 14.66 x 10.85 mm
Diaphaneity: Transparent
Color: Medium dark, strong, very strongly greenish Blue

Gemological Properties

Optical Character: Uniaxial positive
Refractive Index: Over the limit
Birefringence: Not calculated
Specific Gravity: 4.70
Pleochroism: Colorless / Blue
Luster: Vitreous
Phenomenon: None
Fluorescence:
LWUV: None
SWUV: None
Phosphorescence:
LWUV: None
SWUV: None
Absorption Spectrum:
Broad absorption below 430 and above 660 nm; lines at 518, 539, 562, 589, and 653 nm



Facet Diagram: top | side | bottom

Photomicrograph

This blue zircon exhibits uneven coloration in the form of parallel bands of color.



A small healed fracture. The field of view is 2.90 mm across.

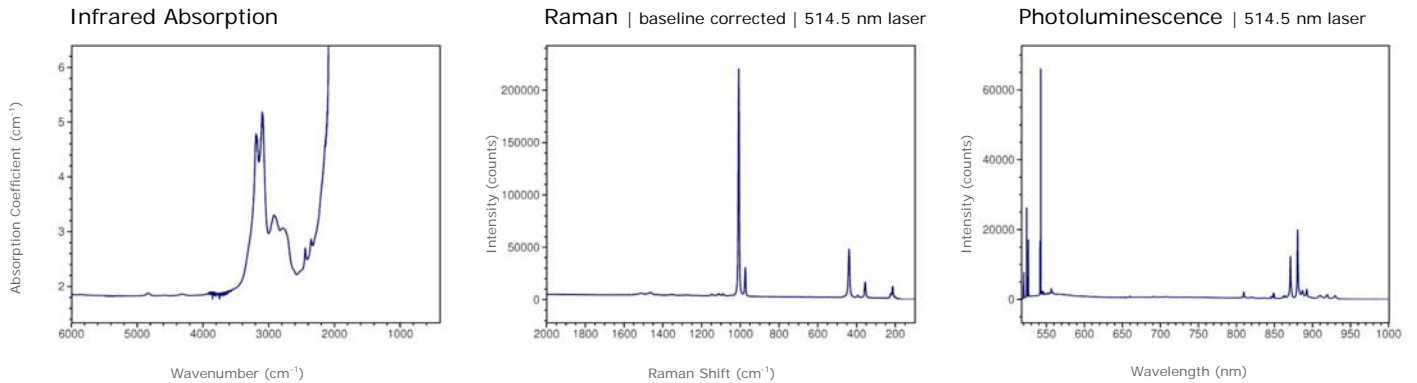
Magnification: 30x

© GIA. Photomicrograph by John Koivula.



© GIA. Photo by Robert Weldon.

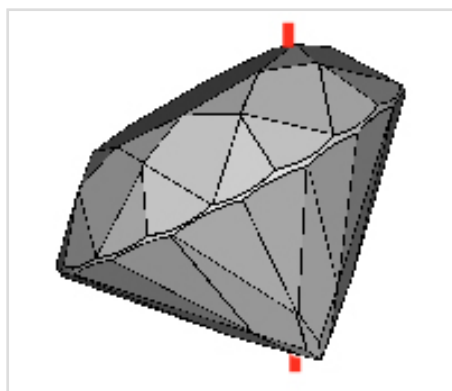
Spectrum



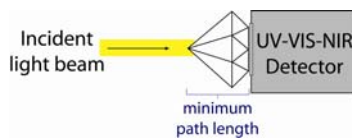
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm⁻¹) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm⁻¹ resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm⁻¹ Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

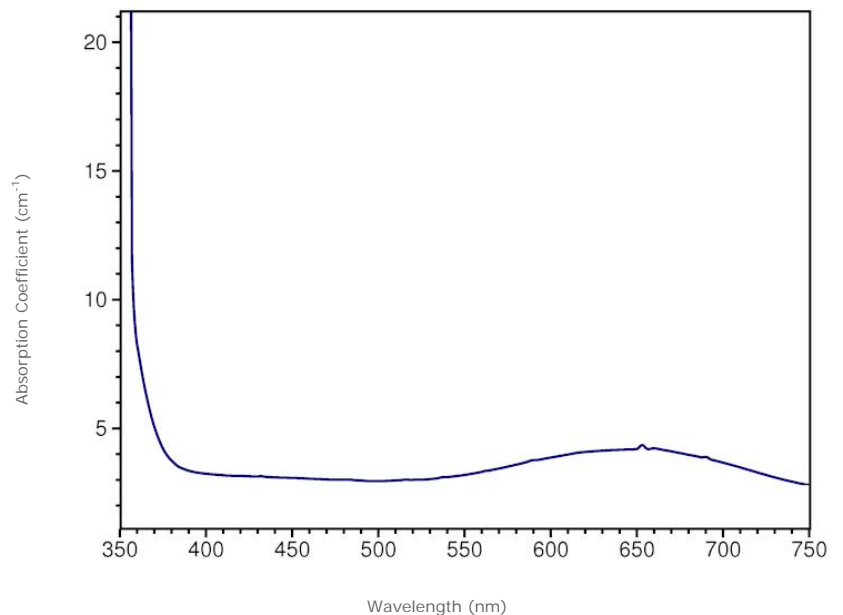
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 10.9 mm

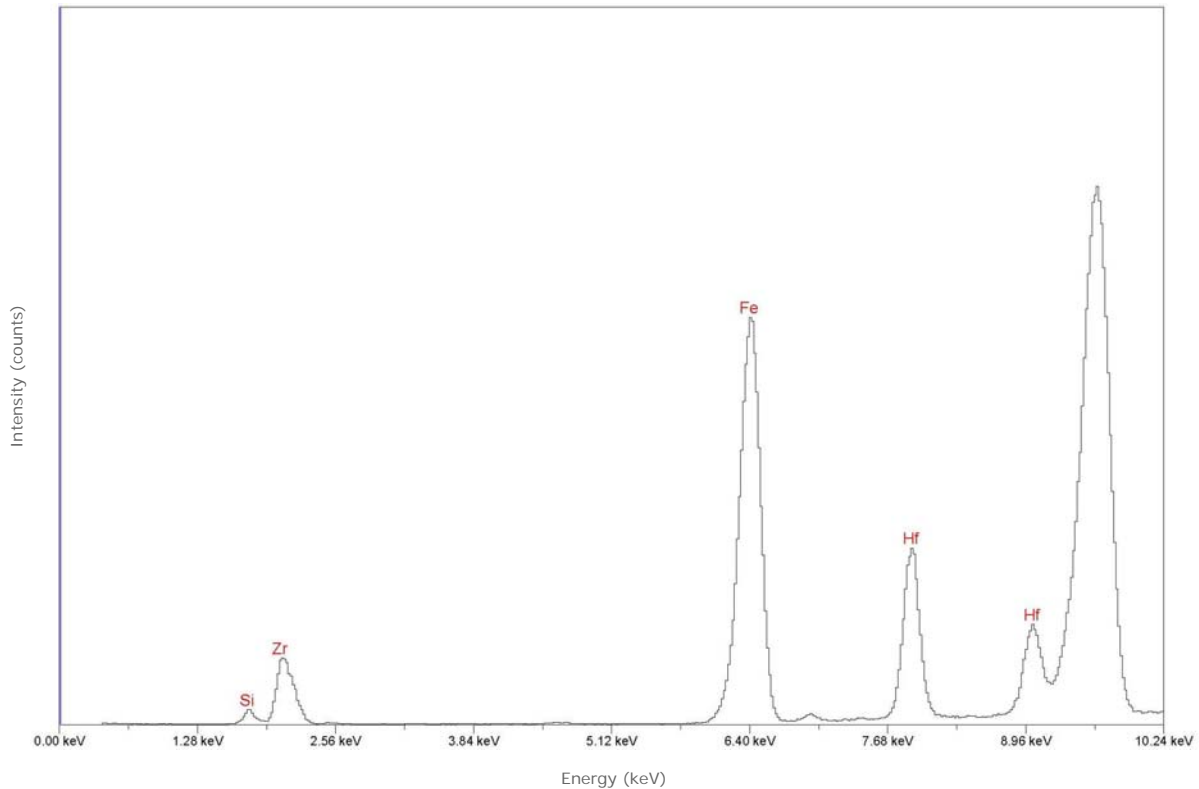


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF



Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium ($Z=11$) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Tanzania, Ruvuma Region, Tunduru

Description

Shape: Novelty

Weight: 8.74 ct

Dimensions: 9.28 x 12.58 x 6.40 mm

Diaphaneity: Transparent

Color: Dark, very slightly brownish, yellowish Orange

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.55

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: Weak orangy yellow with even distribution

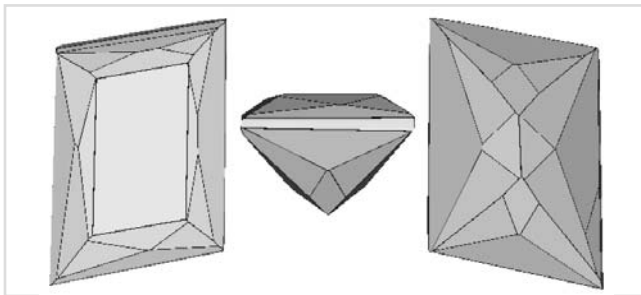
Phosphorescence:

LWUV: None

SWUV: None

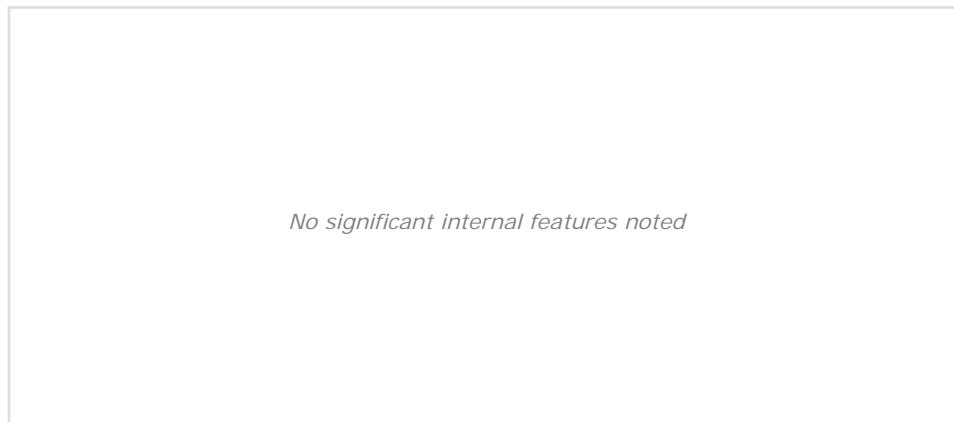
Absorption Spectrum:

Broad absorption below 420 and above 670 nm



Facet Diagram: top | side | bottom

Photomicrograph



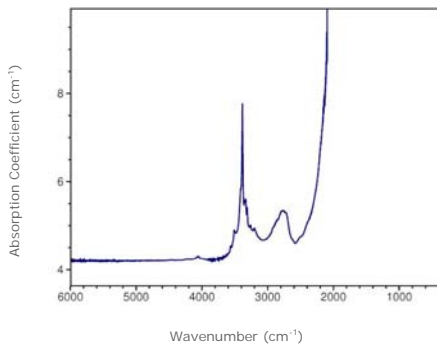
No significant internal features noted



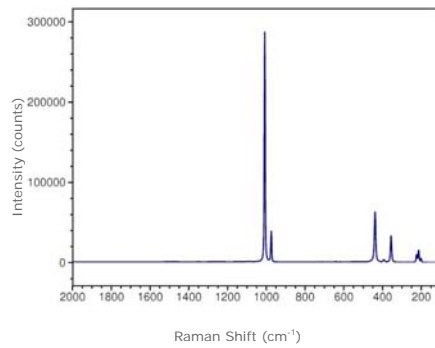
© GIA. Photo by Robert Weldon.

Spectrum

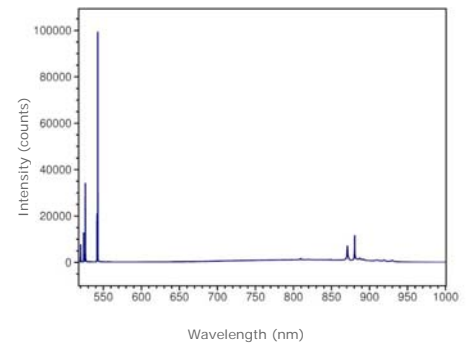
Infrared Absorption



Raman | baseline corrected | 514.5 nm laser



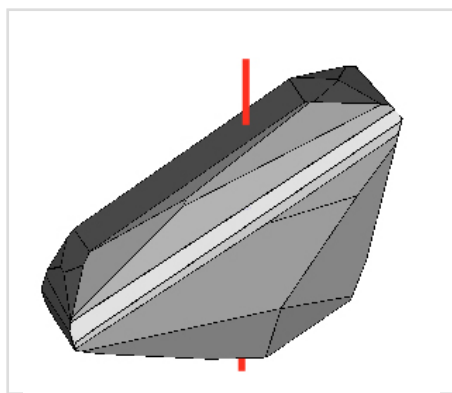
Photoluminescence | 514.5 nm laser



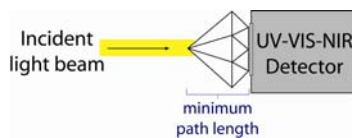
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

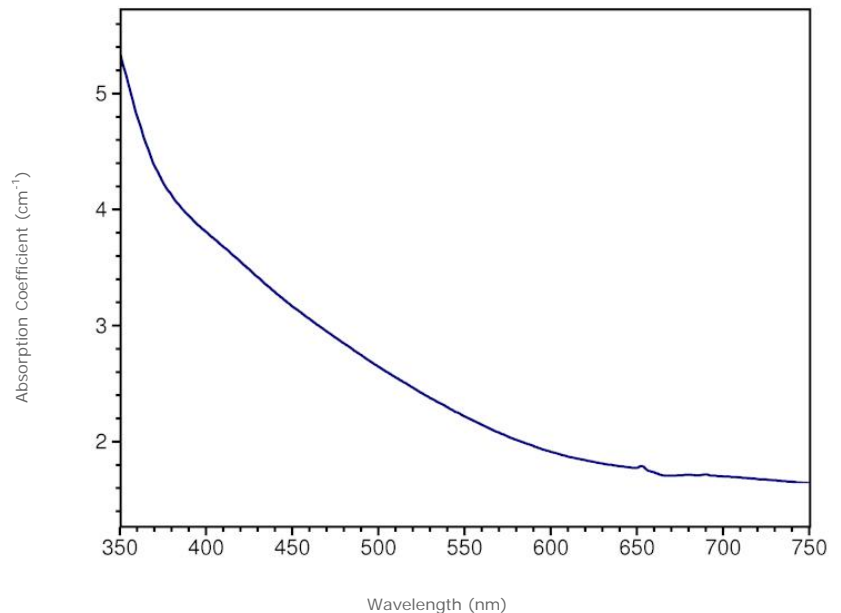
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 6.4 mm

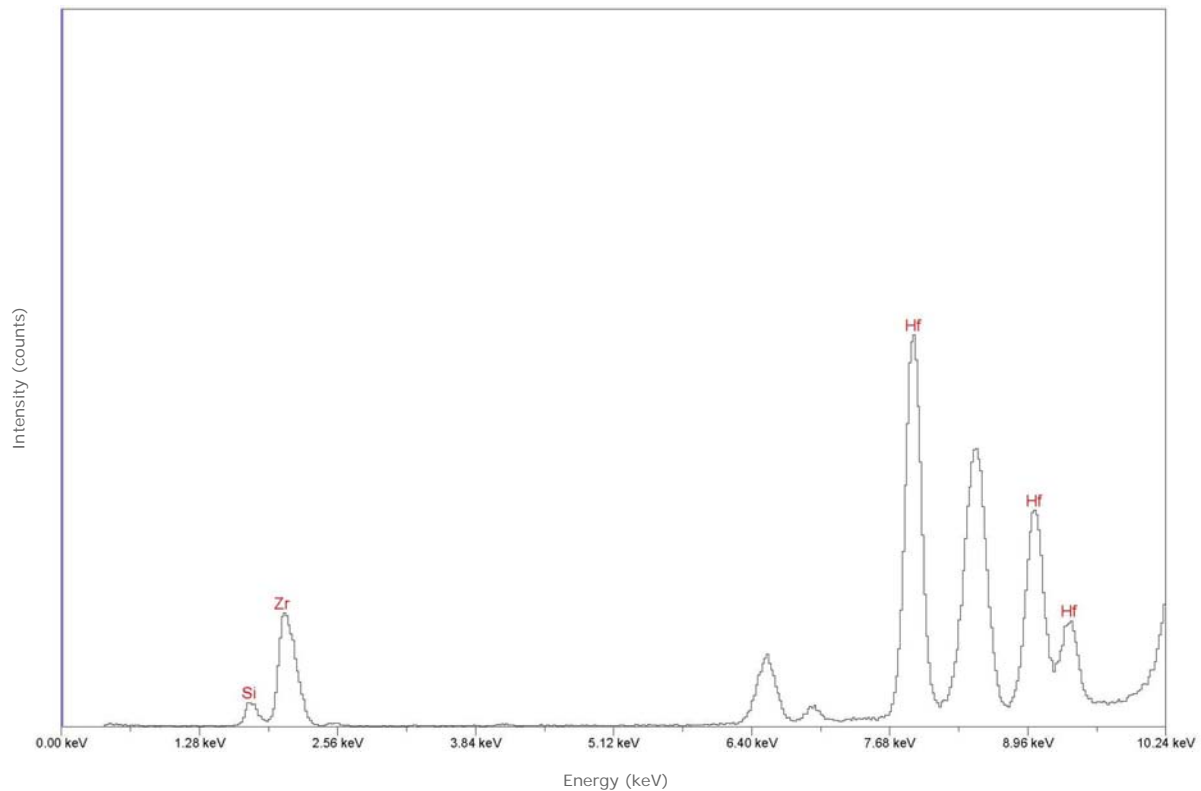


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF



Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium (Z=11) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Tanzania, Arusha Region, Mount Meru*Description*

Shape: Oval

Weight: 12.81 ct

Dimensions: 15.21 x 11.86 x 7.56 mm

Diaphaneity: Transparent

Color: Medium dark, moderately strong, orangy Yellow

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.64

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

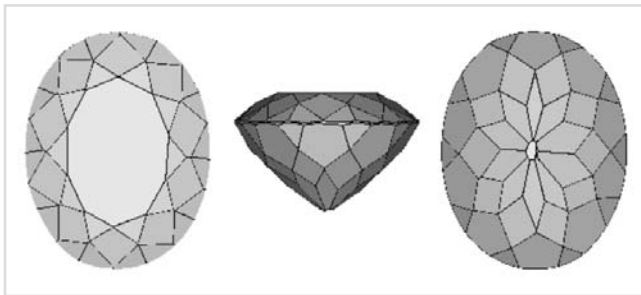
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

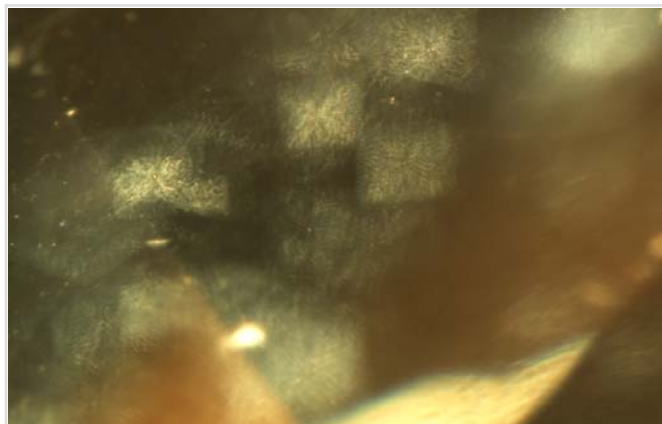
Broad absorption below 420 nm; lines at 437, 485, 518, 539, 562, 589, 653, and 690 nm



Facet Diagram: top | side | bottom

Photomicrograph

The only internal features in this zircon are some vaguely defined cloud-like inclusions.



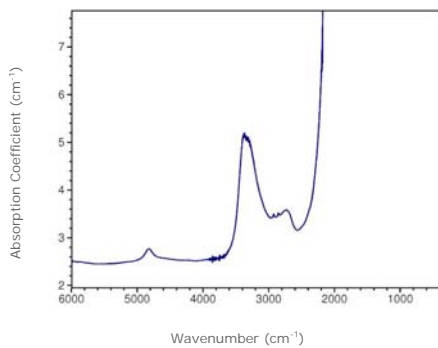
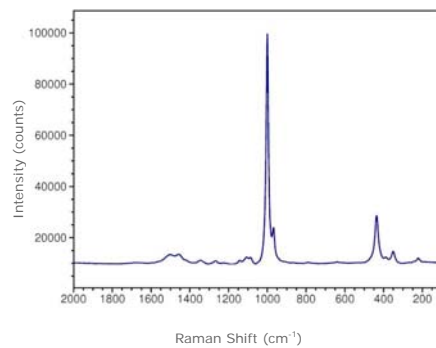
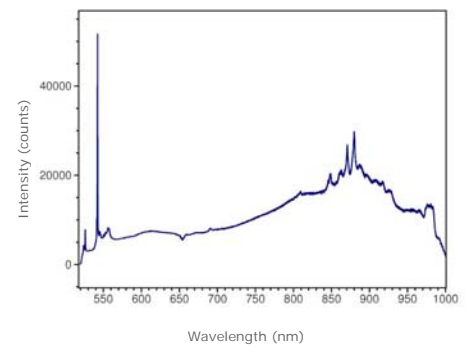
A group of cloud-like inclusions is the main internal feature seen in this zircon. The field of view is 1.45 mm across.

Magnification: 60x

© GIA. Photomicrograph by John Koivula.



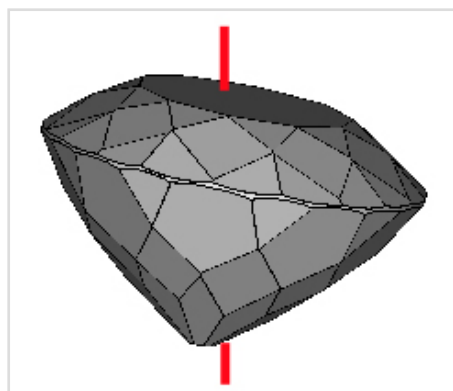
© GIA. Photo by Robert Weldon.

Spectrum
Infrared Absorption

Raman | baseline corrected | 514.5 nm laser

Photoluminescence | 514.5 nm laser


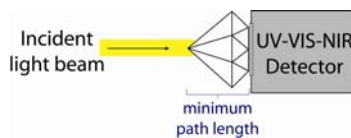
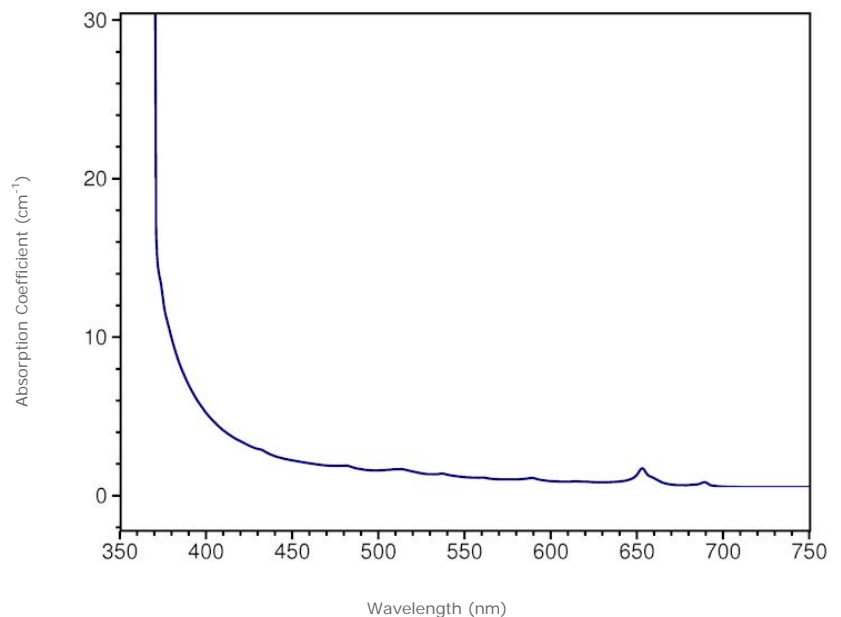
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



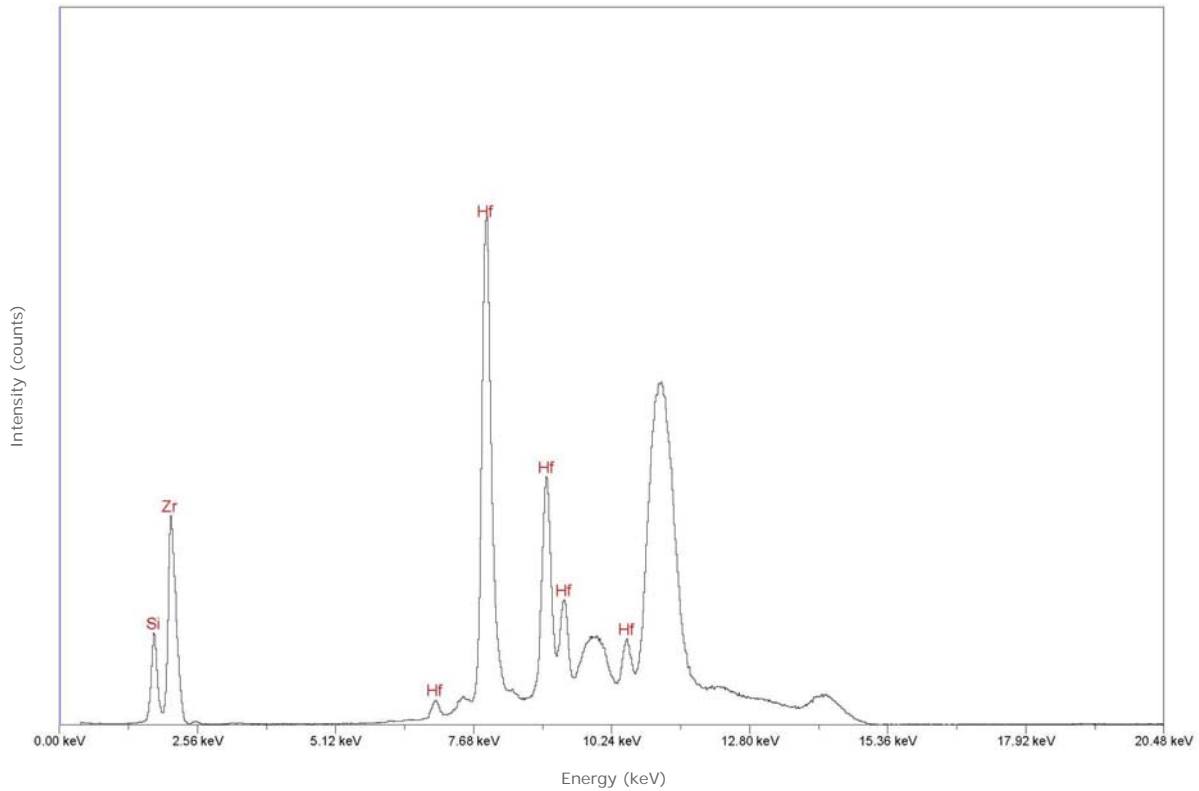
Red line denotes the approximate position of the optic axis


Visible Absorption | min. path length: 7.6 mm


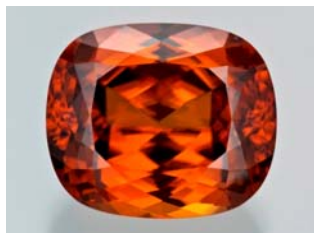
Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF


Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium ($Z=11$) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Tanzania, Dodoma Region

Description

Shape: Cushion

Weight: 21.05 ct

Dimensions: 15.68 x 13.43 x 8.91 mm

Diaphaneity: Transparent

Color: Dark, strong, Orange

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.70

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

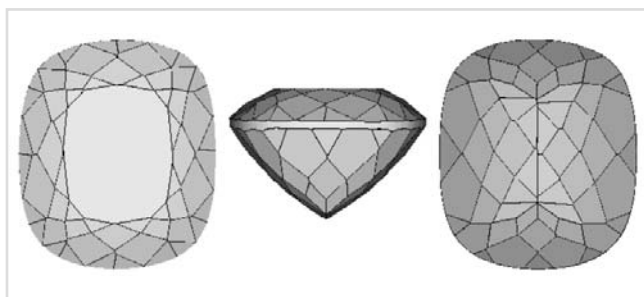
Phosphorescence:

LWUV: None

SWUV: None

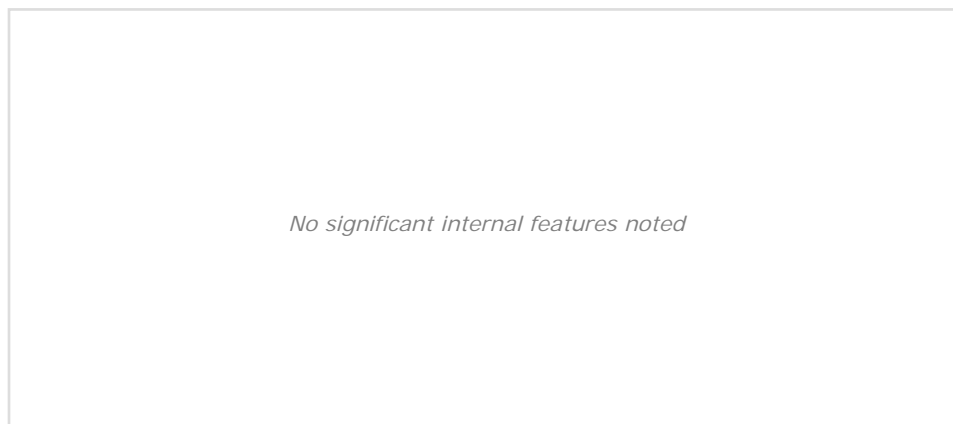
Absorption Spectrum:

Broad absorption below 430 nm

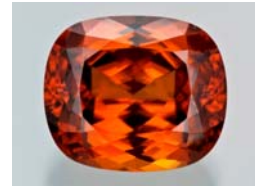


Facet Diagram: top | side | bottom

Photomicrograph



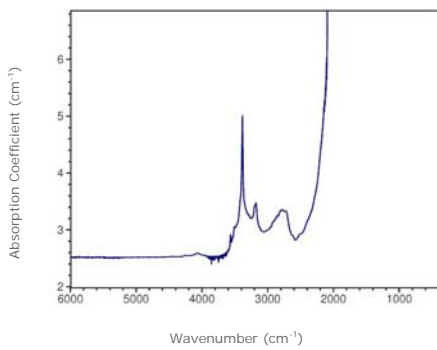
No significant internal features noted



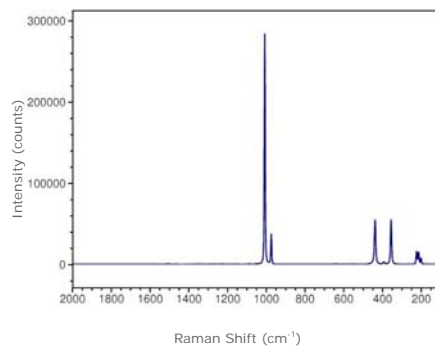
© GIA. Photo by Robert Weldon.

Spectrum

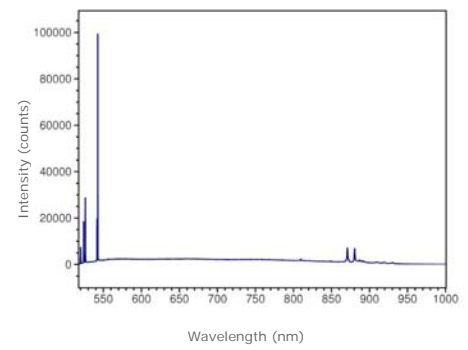
Infrared Absorption



Raman | baseline corrected | 514.5 nm laser



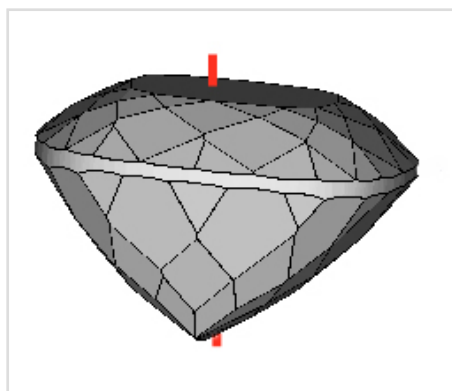
Photoluminescence | 514.5 nm laser



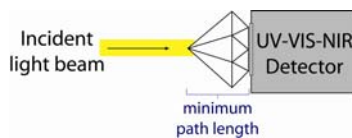
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

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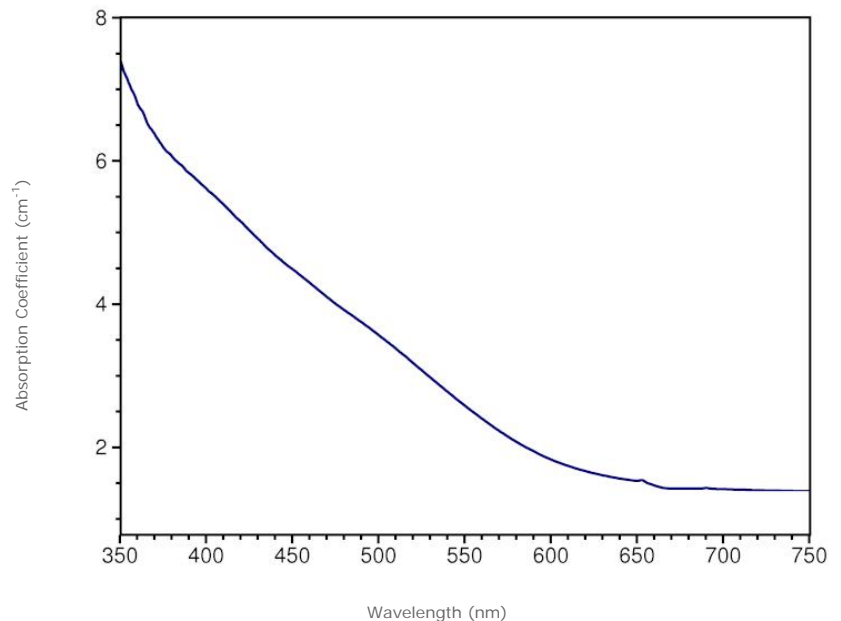
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



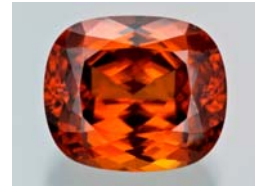
Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 8.9 mm

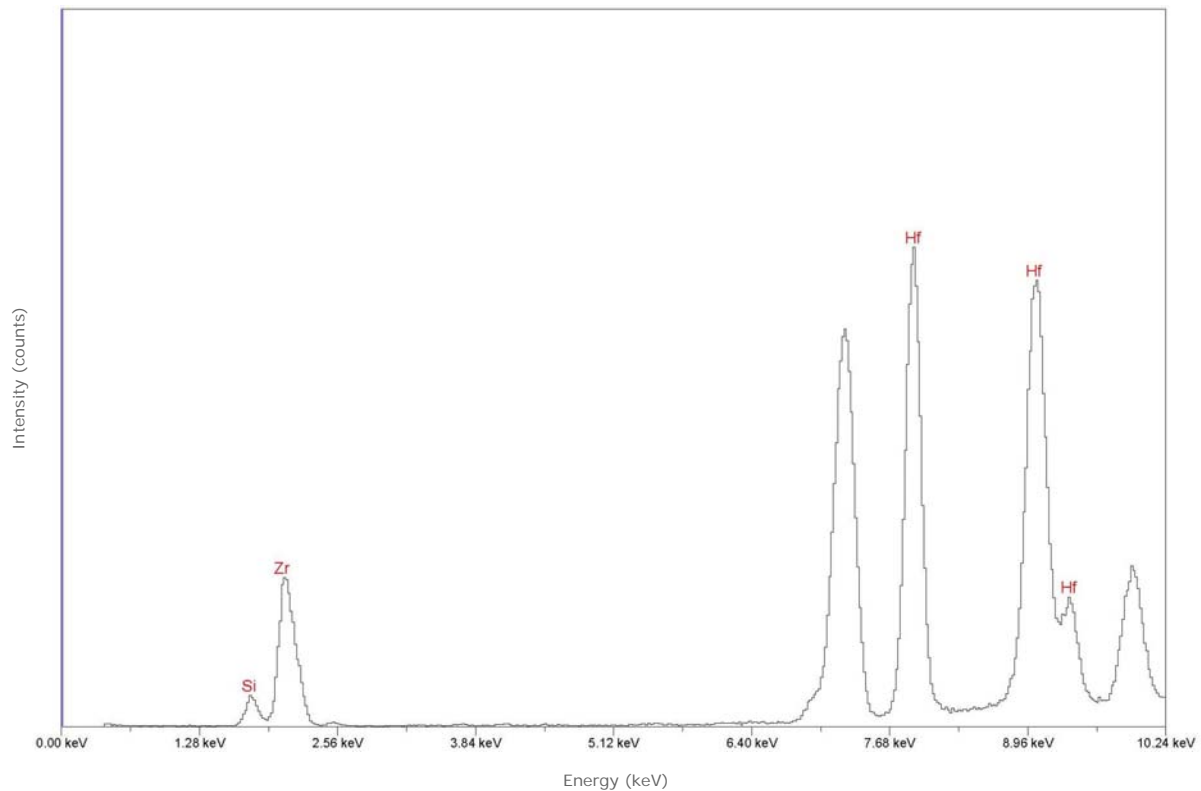


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF



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© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Thailand

Description

Shape: Rectangle

Weight: 4.06 ct

Dimensions: 9.54 x 6.66 x 5.02 mm

Diaphaneity: Transparent

Color: Medium, strong, Orange

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not applicable

Specific Gravity: 4.75

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

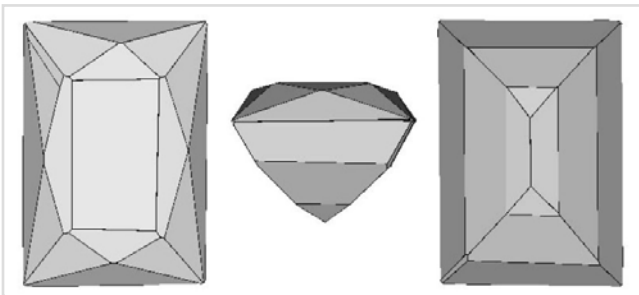
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

Broad absorption below 440 and above 660 nm



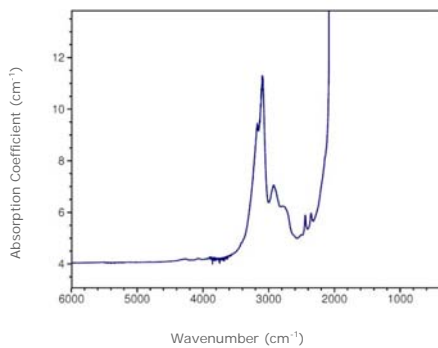
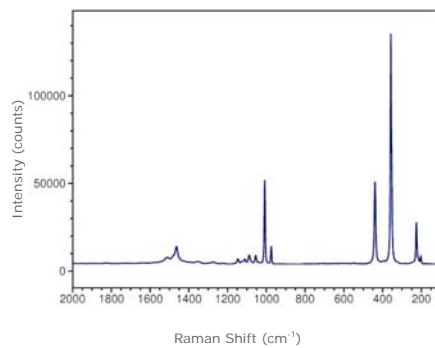
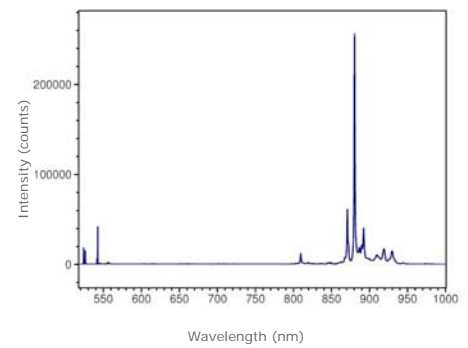
Facet Diagram: top | side | bottom

Photomicrograph

No significant internal features noted



© GIA. Photo by Robert Weldon.

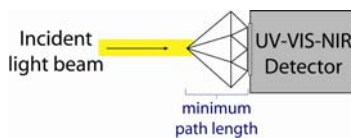
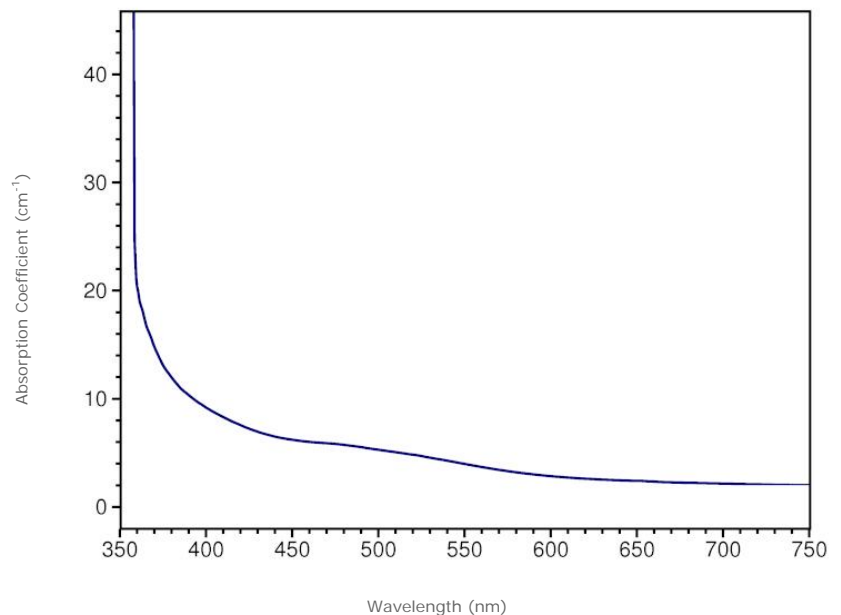
Spectrum
Infrared Absorption

Raman | baseline corrected | 514.5 nm laser

Photoluminescence | 514.5 nm laser


Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

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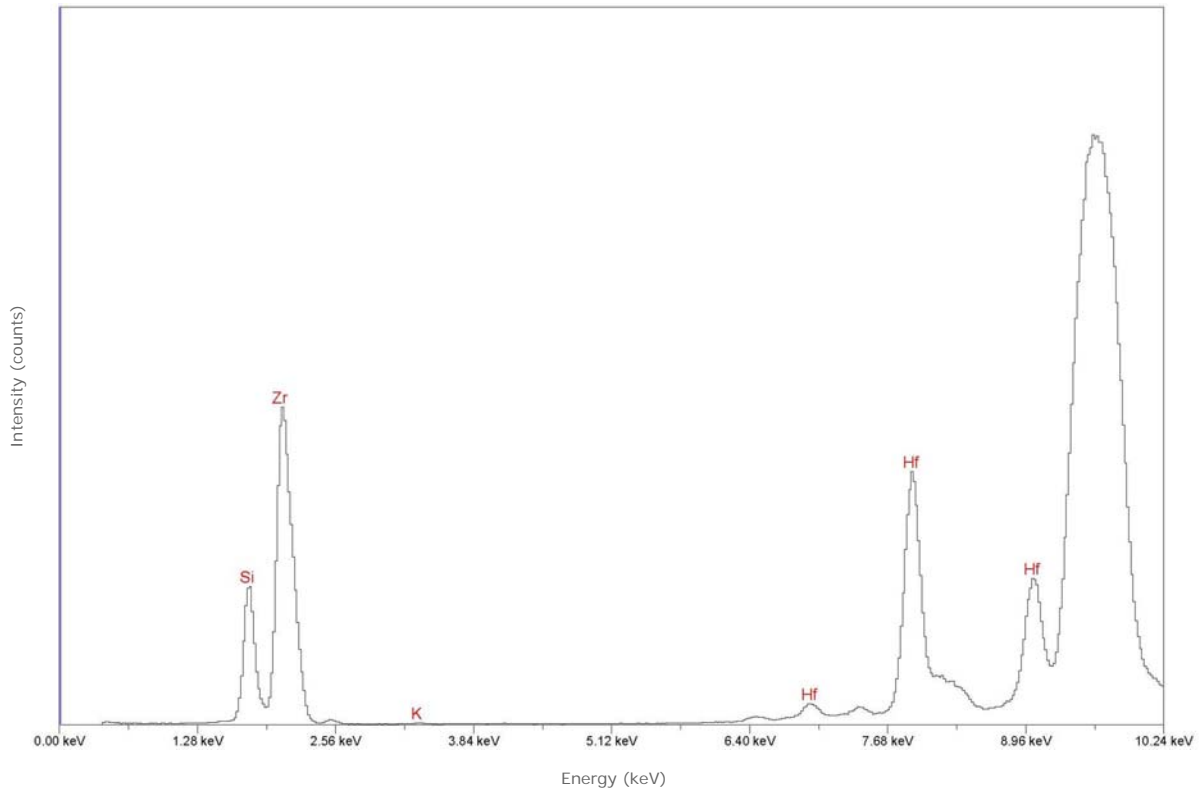
*No optic axis diagram available.
The location of the optic axis could not be determined.*


Visible Absorption | min. path length: 5.0 mm


Transmission absorption spectra in the UV to near-IR range (250–1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF


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© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

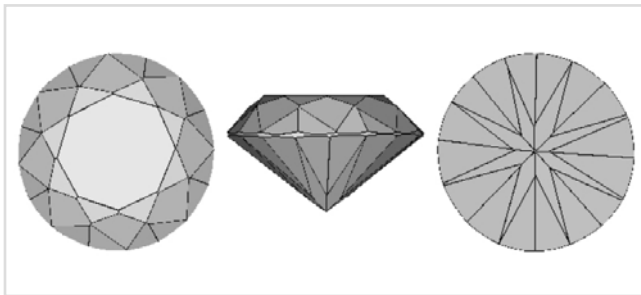
Thailand

Description

Shape: Round
Weight: 15.13 ct
Dimensions: 14.27 x 14.54 x 8.51 mm
Diaphaneity: Transparent
Color: Medium, very slightly brownish, yellowish Orange

Gemological Properties

Optical Character: Uniaxial positive
Refractive Index: Over the limit
Birefringence: Not calculated
Specific Gravity: 4.70
Pleochroism: None
Luster: Vitreous
Phenomenon: None
Fluorescence:
LWUV: None
SWUV: None
Phosphorescence:
LWUV: None
SWUV: None
Absorption Spectrum:
Broad absorption below 440 and above 660 nm



Facet Diagram: top | side | bottom

Photomicrograph

The only internal features present in this zircon are parallel, banded color zones and some parallel trails of tiny particles.



Several parallel trails of tiny particles of uncertain identity. The field of view is 2.90 mm across.

Magnification: 30x

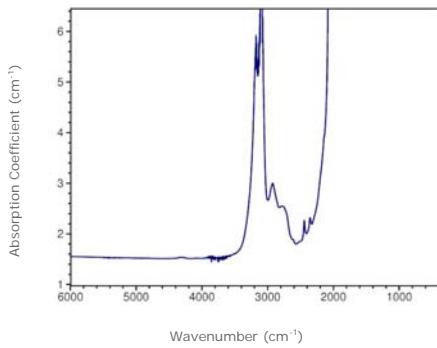
© GIA. Photomicrograph by John Koivula.



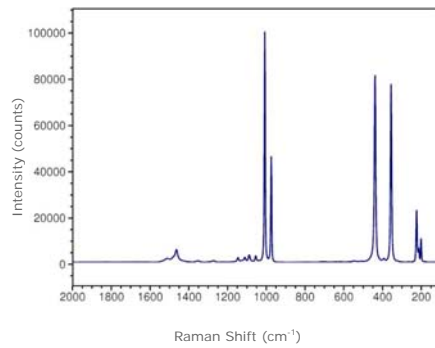
© GIA. Photo by Robert Weldon.

Spectrum

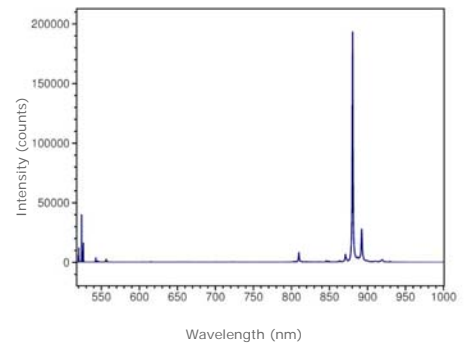
Infrared Absorption



Raman | baseline corrected | 514.5 nm laser



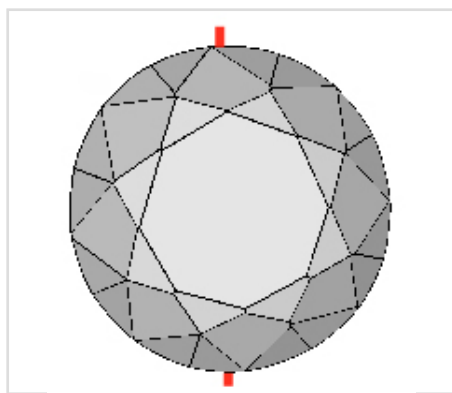
Photoluminescence | 514.5 nm laser



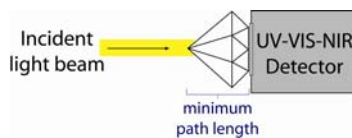
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

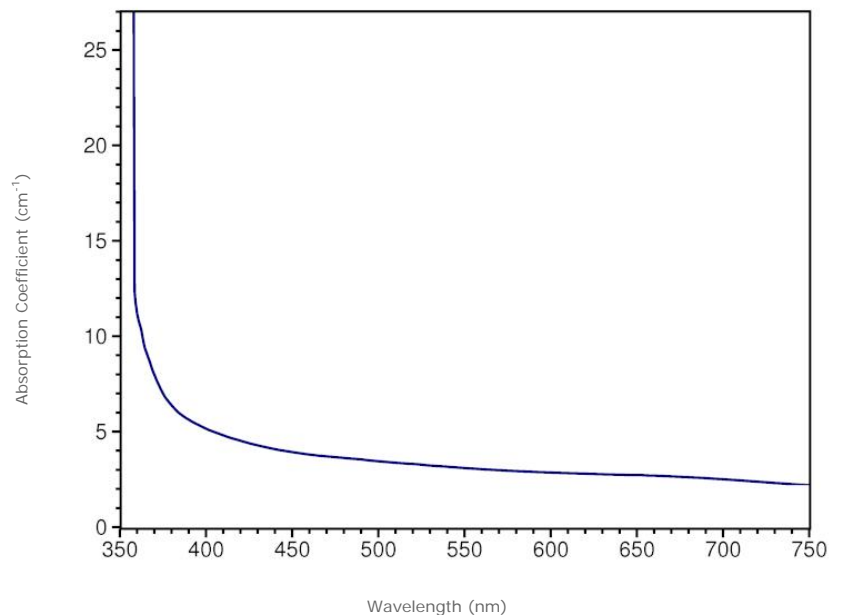
Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.



Red line denotes the approximate position of the optic axis



Visible Absorption | min. path length: 8.5 mm

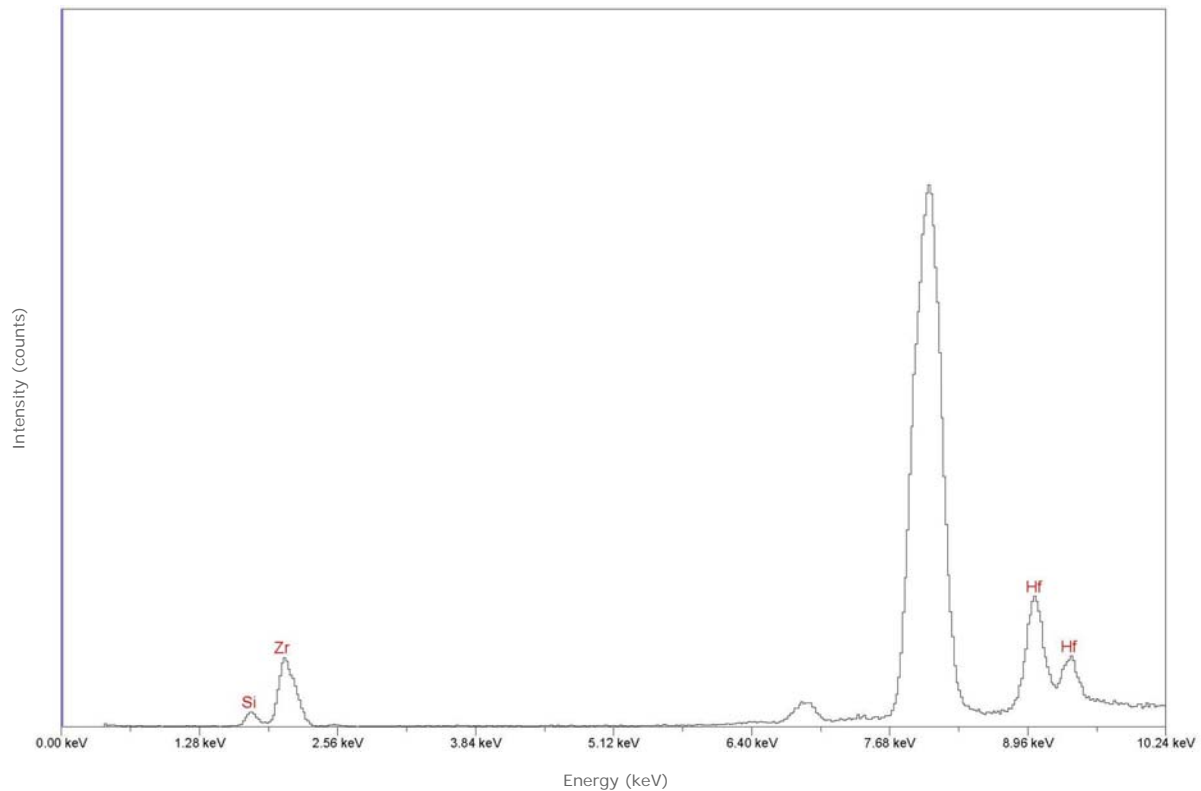


Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



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Chemistry | EDXRF



Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium ($Z=11$) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Madagascar, Fianarantsoa Province, Ilakaka*Description*

Shape: Oval

Weight: 7.66 ct

Dimensions: 12.81 x 10.32 x 6.68 mm

Diaphaneity: Transparent

Color: Medium light, slightly grayish, greenish Yellow

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.68

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

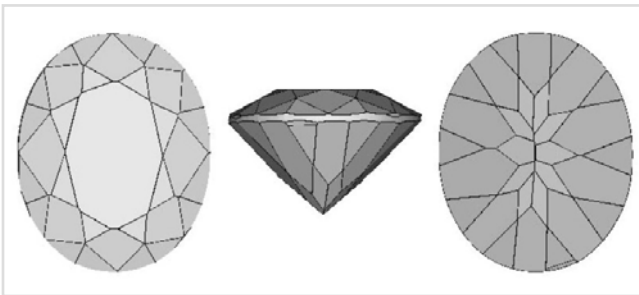
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

Broad absorption below 420 nm; lines at 477, 485, 513, 518, 539, 543, 562, 589, 615, 621, 653, 660, and 690 nm



Facet Diagram: top | side | bottom

Photomicrograph

This green zircon is relatively free of internal features.



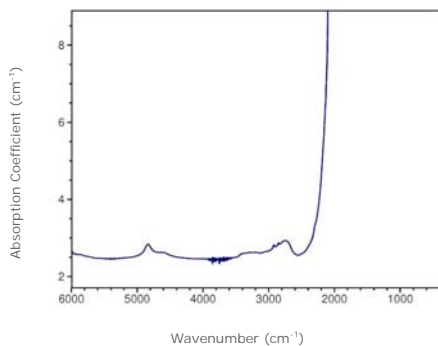
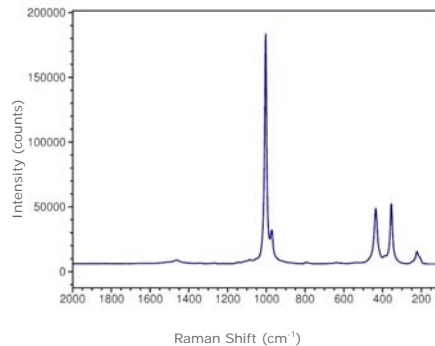
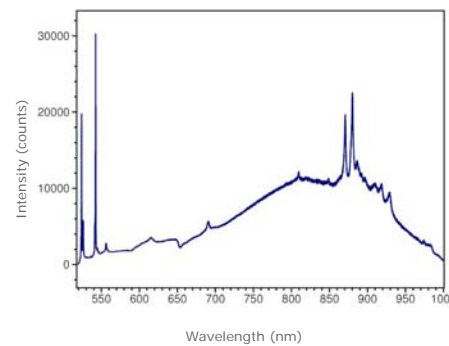
A group of small particles lying along a plane. The field of view is 1.45 mm across.

Magnification: 60x

© GIA. Photomicrograph by John Koivula.



© GIA. Photo by Robert Weldon.

Spectrum
Infrared Absorption

Raman | baseline corrected | 514.5 nm laser

Photoluminescence | 514.5 nm laser


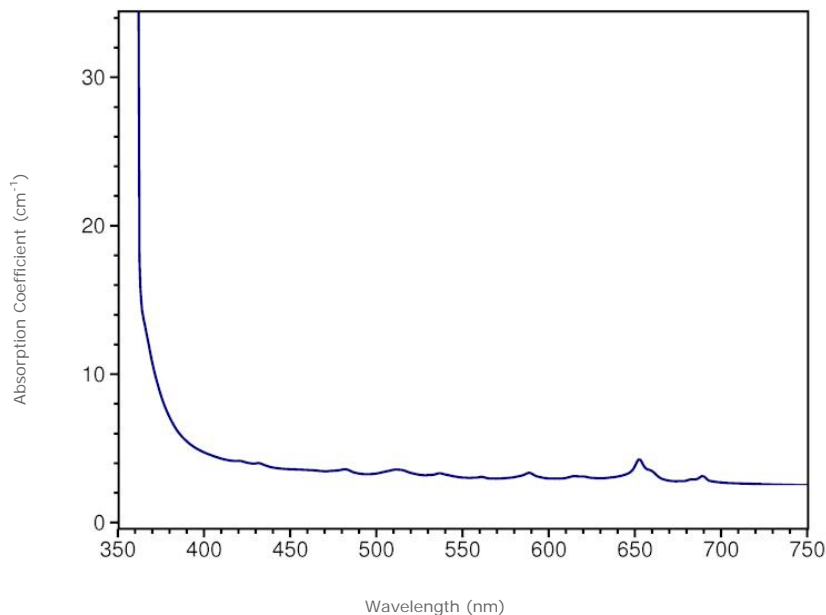
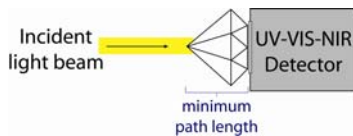
Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm^{-1}) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm^{-1} resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

Raman spectra were collected over the range 100–2000 cm^{-1} Raman shift using a Renishaw InVia Raman microscope (3 additive scans, and excitation produced by 514.5 nm Ar-ion or 633 nm He-Ne lasers). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted.

Photoluminescence spectra were collected in the 517–1000 nm range using a Renishaw InVia Raman microscope (single scan, and excitation produced by 514.5 nm Ar-ion laser). Analysis was done using a focused beam on the table facet of the gemstone unless otherwise noted, and the laser intensity was adjusted to avoid detector saturation caused by sample fluorescence.

Visible Absorption | min. path length: 6.7 mm

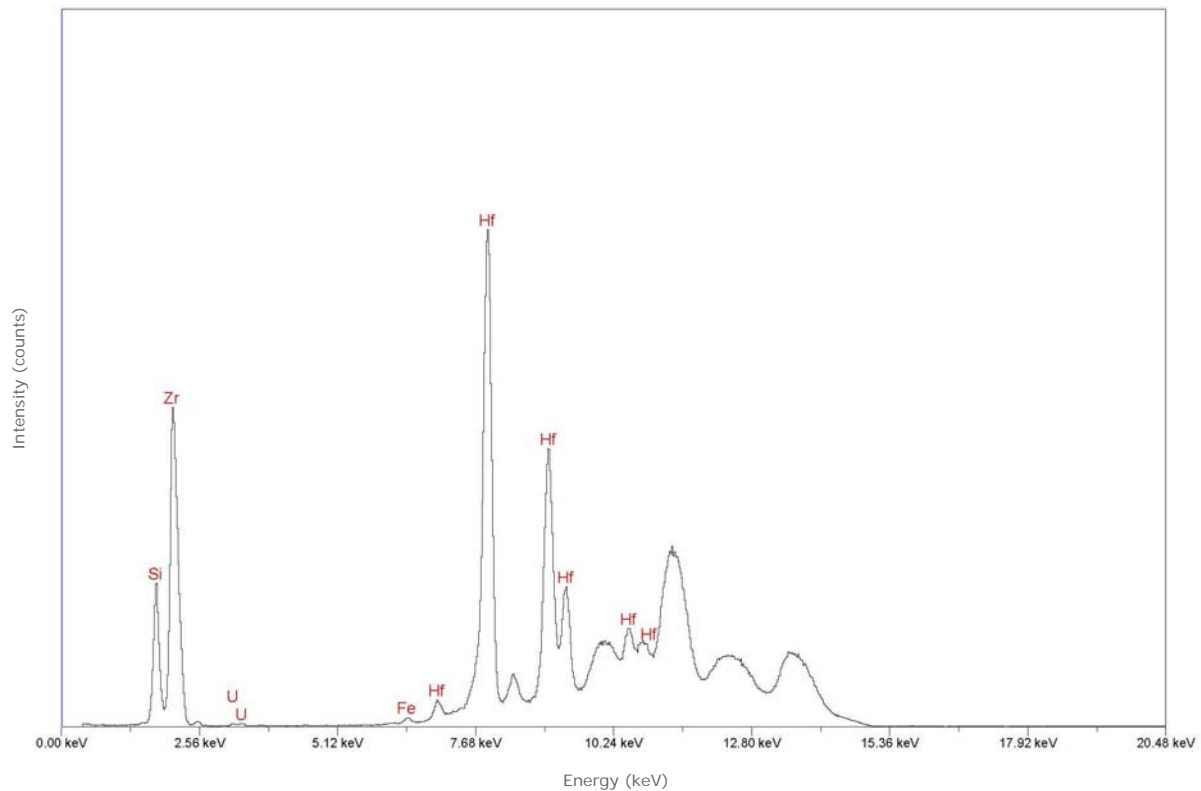
*No optic axis diagram available.
The location of the optic axis could not be determined.*



Transmission absorption spectra in the UV to near-IR range (250–1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.



© GIA. Photo by Robert Weldon.

Chemistry | EDXRF


Qualitative energy-dispersive X-ray fluorescence (EDXRF) data were collected using a Thermo ARL QuantX EDXRF analyzer (15 kV, 0.02–1.98 mA (auto adjusted based on deadtime), 100 seconds livetime, vacuum atmosphere, aluminum filter). These conditions were selected to optimize the detection of the transition metals (such as iron or chromium) that are responsible for the coloration of most gemstones. Only the peaks for chemical elements that were clearly identifiable are labeled by element symbols in the spectrum. Most other peaks are diffraction artifacts. Our EDXRF method can detect most elements with higher atomic numbers than sodium ($Z=11$) in the Periodic Table; depending on the element, the lower limit of detection is between 1 and 100 parts per million (0.0001 to 0.01%).



© GIA. Photo by Robert Weldon.

Species - Variety:

Zircon

Locality (as stated in Dr. Gübelin's records):

Madagascar, Fianarantsoa Province, Ilakaka

Description

Shape: Triangle

Weight: 2.01 ct

Dimensions: 7.35 x 9.52 x 4.72 mm

Diaphaneity: Transparent

Color: Dark, moderately strong, slightly yellowish Green

Gemological Properties

Optical Character: Uniaxial positive

Refractive Index: Over the limit

Birefringence: Not calculated

Specific Gravity: 4.00

Pleochroism: None

Luster: Vitreous

Phenomenon: None

Fluorescence:

LWUV: None

SWUV: None

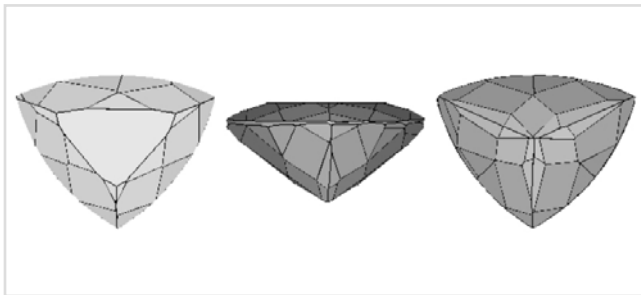
Phosphorescence:

LWUV: None

SWUV: None

Absorption Spectrum:

Broad absorption below 430 and above 650 nm



Facet Diagram: top | side | bottom

Photomicrograph

This zircon is free of internal features except for several parallel trails of tiny particles.



These trails of tiny particles are aligned along parallel growth zoning. The field of view is 1.45 mm across.

Magnification: 60x

© GIA. Photomicrograph by John Koivula.

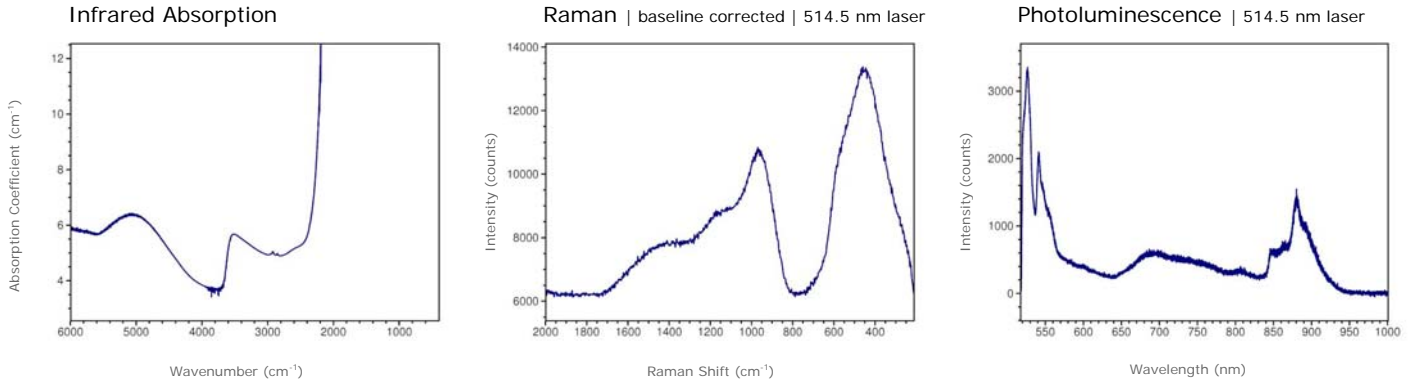
GIA Gem Database | Edward J. Gübelin Collection

Zircon | Madagascar, Fianarantsoa Province
GIA Collection Number: 35605



© GIA. Photo by Robert Weldon.

Spectrum

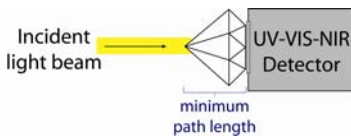


Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm⁻¹) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm⁻¹ resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

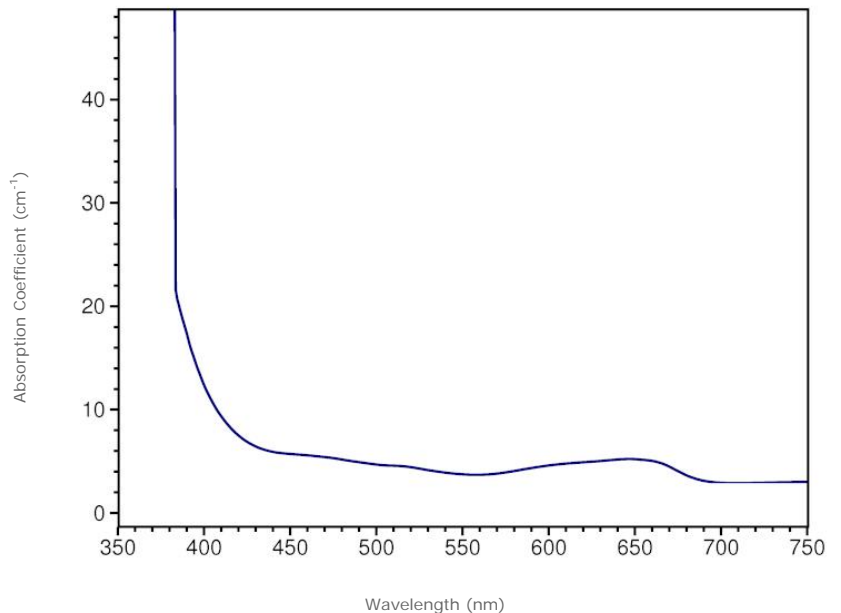
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No optic axis diagram available.
This gem material is optically uniaxial positive.



Visible Absorption | min. path length: 4.7 mm



Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.

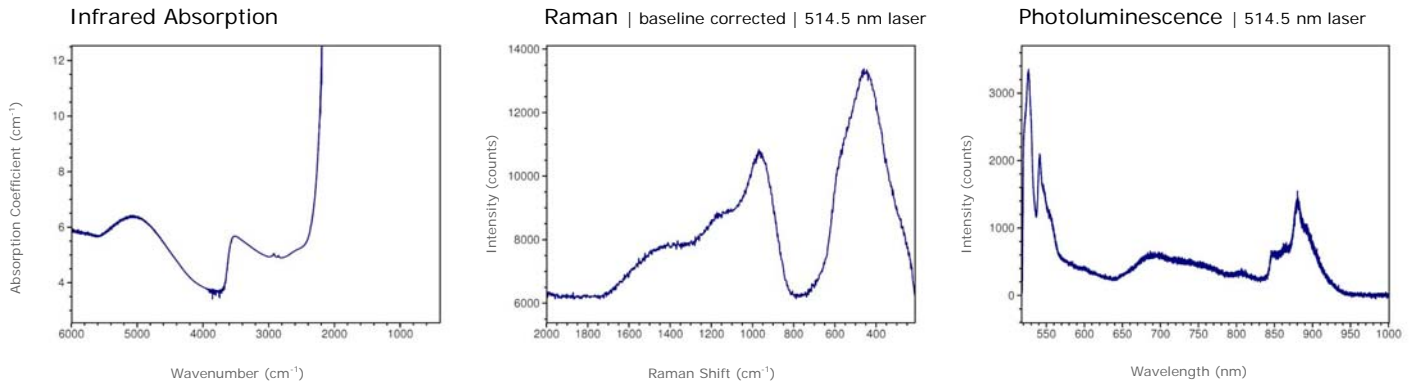
GIA Gem Database | Edward J. Gübelin Collection

Zircon | Madagascar, Fianarantsoa Province
GIA Collection Number: 35605



© GIA. Photo by Robert Weldon.

Spectrum

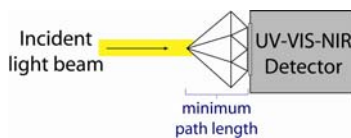


Transmission infrared absorption spectra were collected in the mid-IR range (400–6000 cm⁻¹) using a Thermo-Nicolet 6700 FTIR spectrometer (KBr beamsplitter, MCT-B detector, 1 to 4 cm⁻¹ resolution, and 128 scans). A 6x beam condenser was used to focus light through the girdle region of the gemstone to obtain a maximum signal.

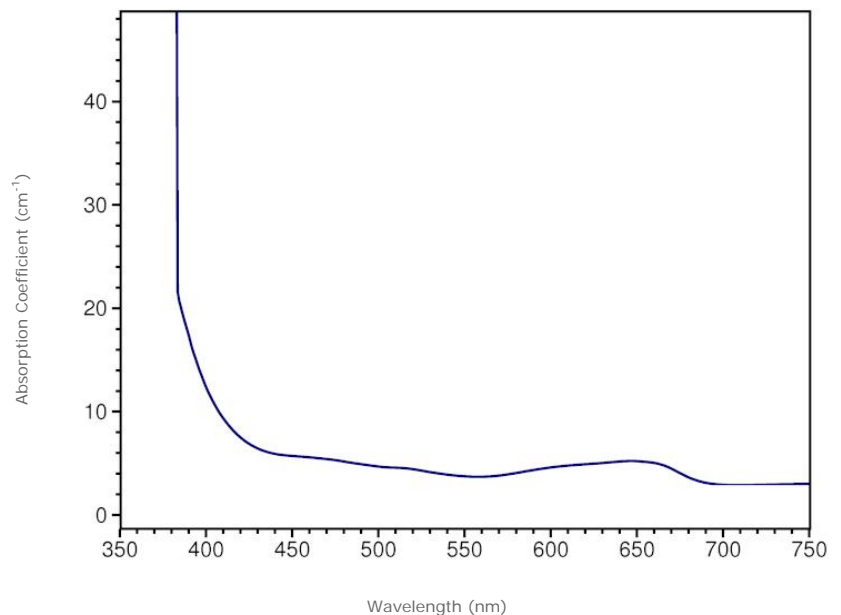
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No optic axis diagram available.
This gem material is optically amorphous.



Visible Absorption | min. path length: 4.7 mm



Transmission absorption spectra in the UV to near-IR range (250-1000 nm) were collected using a Hitachi U4001 spectrometer (2.0 nm slit, 1.0 nm data interval, and 120 nm/min scan speed). Unless otherwise noted, an unpolarized light beam was focused on the culet area of the optically unoriented sample.