SSEF News

SGG Zentralkurs in Meisterschwanden
Dienstag 21 April 2015

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New SSEF office since January 2015:

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Jadeite with chromium-rich vein

Cr-rich veins are common in jadeite from Myanmar
Brazilian emerald

in jadeite-like cutting & setting

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Jadeite necklace and ring.

Emerald with engraving of Catherine the Great

Comparing this engraved portrait with historic paintings shows a very close resemblance, notably with the portraits of the Catherine the Great (1729 – 1796) Empress of the Russian Empire by William Dickinson (from 1773) and Virgilius Erichsen (from 1830), both being part nowadays of the State Hermitage Museum in Saint Petersburg (Russia).
emerald with distinct aquamarine-component

The bands 370 and 420 nm due to octahedral Fe\(^{3+}\) and induce a yellowish (greenish) colour

Fe\(^{2+}\) in the structural channels (820 nm) causes the blue colour

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Bluish green Cr-bearing *beryl* with dominating aquamarine-component

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Fe\(^{2+}\) in the structural channels (820 nm) causes the blue colour

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54.84 ct
Bluish green emerald with no aquamarine-component

9.46 ct

Bluish green colour due to absence of Fe$^{3+}$ in octahedral sites resulting in transmission-window in the blue (and LWUV)

Very low Fe$^{2+}$ in octahedral sites and in the structural channels: No colour contribution

Hydrothermal synthetic emerald of 67 ct

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Emerald imitation: Foiled back topaz

La Belle of Asia...

Historical sapphire from Ceylon of 392.52 ct
Sold at auction in November 2014, World record $17,295,796
SSEF report no. 72359
Exceptional Kashmir sapphires

Highly matching in colour and outstanding clarity

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BYG Sapphires from basaltic deposits

Photo: Sutas Singhamroon
Sapphires from Nigeria (Basaltic source)

Typical features of basaltic sapphires:

- Often greenish blue colour
- Quite often distinct milkyness
- Fe-rich: Characteristic absorption spectrum
- Distinct OH- (hydroxyl) in IR spectrum
Ruby

Heated ruby from Mozambique

Neo-healing fissure characteristic for heat treatment (and FTIR peaks at 3309 cm⁻¹ with small side bands)
Exceptional unheated ruby from Mozambique 23 ct

New world record for ruby?

The Sunrise ruby, a 25.59 ct Burmese ruby of "pigeon's blood" hue, will be offered at auction by Sotheby's Geneva on 12 May 2015 with an estimated value of $12-18 million.

Latest news 13th May 2015: Sold for 30.3 million US$
27 ct Burmese ruby in a historic setting

Padparadscha from Ceylon, 46 ct

Colour is a combination of Cr$^{3+}$, Fe$^{3+}$ and yellow colour centre
Yellow sapphire with unstable colour

18.09 ct

Heated spinel from Tanzania

Heat treatment rarely applied on spinels so far:
- Only limited enhancement
- Colour change only slight
- Fine milkyness is said to be reduced.
Heated spinel from Tanzania

Diamond wi(n)dow
Diamond Crrrrracks...

Ca. 10 ct

Cleavage cracks due to mechanical shock at table edge, but assisted by „fixed“ setting.
Surface alterations of Conch pearls:

Conch pearl with organic surface layer

Originally interpreted as a varnish = surface treatment (SSEF press release September 2013), this is in fact a natural organic cover often seen partially on conch pearls.
Conch pearls with damaged (corroded) surface

Surface alteration (corrosion) due to exposure to acidic solutions

Stability testing with cosmetics

EN 438-2 (NIHS 96-50-paragraph 6.8/6.9)
Stability testing with sweat (synthetic)

The Cirebon ship wreck (ca. 10th century)
Pearls from the Cirebon wreck (ca. 10th century)

Chinese coins and ceramics firmly place the wreck in the 10th Century AD.

Radiocarbon age dating of these pearls

The $^{14}$C dating perfectly fits with the assumed date of this ship wreck based on pottery and coins.

Project with ETH-Zurich
289 natural pearls of partly remarkable size (maximum diameter up to 12.65 mm approximately), strung on four smoothly and regularly graduated strands.

Thank you for your attention