

# Fluorescence observed in a Tanzanian garnet

CARA and BEAR WILLIAMS report on interesting results obtained testing these newly marketed garnets under UV light

**Pyrope-spessartine garnet is reported as having been mined in the Lindi region of southern Tanzania. Introduced on the market in late 2005, it has typically been marketed as 'Imperial' and/or 'champagne' garnet.**

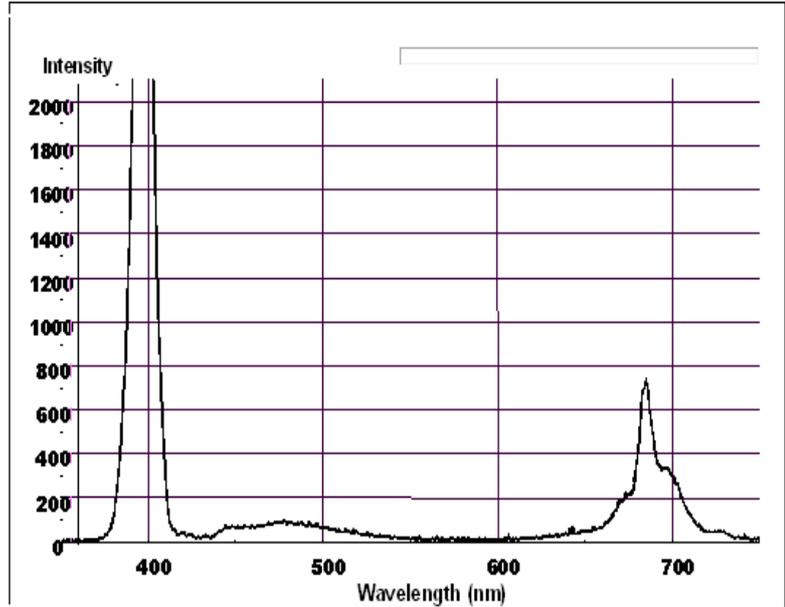
The sample illustrated (1) weighed 2.82 ct. Of immediate note was the colour shift from a cinnamon brown in incandescent light, to a pinkish champagne brown under fluorescent light.



*Pyrope spessartine garnet weighing 2.82 ct. Photo Bear Williams.*

According to the gemmological literature to date, garnets are inert to both long- and short-wave ultraviolet (UV) light. Occasionally a new material or technology will come along that causes us to rethink our assumptions. The large and varied garnet family historically has produced many such surprises. The colour shift prompted us to test UV excitation reactions (2). Although very weak, fluorescence under long-wave excitation was definitely visible with the naked eye. Fluorescence was slightly more pronounced in digital photos.

Next we ran a UV fluorescence spectrum that showed a significant emission peak at 685 nm (3). While not visible with a conventional (analogue) spectroscope, it is readily

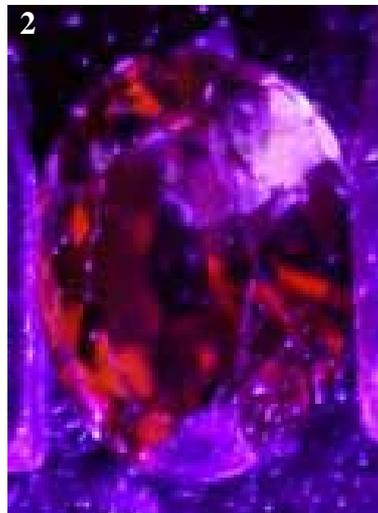


*3. UV fluorescence spectrum of the pyrope spessartine garnet showing emission peak at 685 nm.*

visible with a UV-NIR spectrophotometer. All indications point to Cr as the cause of the fluorescence and the emission spectrum, but possible further research and testing may need to be done to confirm that other elements are not responsible.

Other gemmological properties are as follows: RI 1.756, SG 3.82.

*Fluorescence of the garnet under long-wave UV. Photo Bear Williams.*



Spectroscopic tests revealed a typical spessartine spectrum with strong 432 nm absorption (manganese). Properties are similar to other colour-change garnets, but the quantity of iron to fully quench the fluorescence is lacking.

The polariscope indicated anomalous birefringence. Microscopic examination exhibited straight needles and a birefringent subhedral crystal inclusion. Of particular interest was the high magnetic susceptibility, in that it could be dragged across a surface with a small hand magnet.

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