

# News

NEWS

31/08/2007

## GRS Alert: Clarity enhancement of rubies with a foreign solid filler including Bismuth

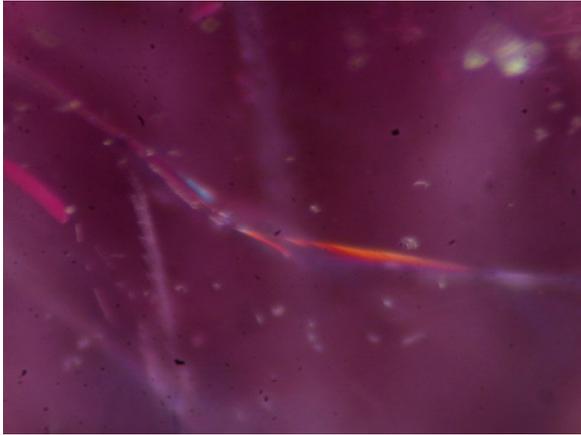
For the last couple of years, the appearance of lead-glass treated rubies has been widely recognized in the trade. The treatment is primarily used to enhance clarity in rubies or pink sapphires of lower commercial value. This treatment has been regularly seen at the GRS laboratory in rubies from Madagascar as well as in Star Rubies, such as from Burma (Myanmar) to mask disturbing single cracks. The lead-glass filling also contained some coloring agents which contributed to increase of color saturation. The identification of the lead-glass-treated corundum could be identified by optical methods, such as the presence of flashes of rainbow color as well as isolated flat gas bubbles (see fig. 1 and fig. 2). Confirmation of the Identification of the filler can be made by non-destructive chemical testing such as using ED-XRF analysis (see fig. 3). A strong lead-signal by ED-XRF testing (Pb, fig. 4) is conclusive of this particular treatment.

By By Dr. A. Peretti and W. Bieri

Recently, however, GRS discovered a new version of this treatment. It was detected in large pink sapphires of large size over 20cts and commercial significance. The material contained less iron than Madagascar rubies or pink sapphires as part of the trace elements. In the microscope, the same rainbow color flashes are observed and the same gas-bubbles are found (fig. 2) such as in the lead-glass-filled rubies. With special analysis we identified a part of the filler as bismuth (Bi). No concentrations of lead (Pb) were found although the optical appearance was similar to the lead-glass treated rubies. The clarity enhancement in this new type of treatment includes Bi and may be called "bismuth-glass" – treated. Warning: The presence of "rainbow flashes" in the microscope is not conclusive anymore for the use of lead in a solid filler. Special testing is mandatory to confirm this new treatment as well as to distinguish them from lead-glass-treated counterparts.

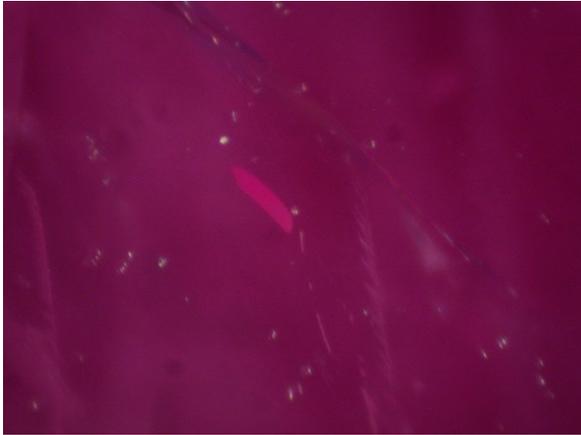
Stones of this category will be called by GRS as:

*Treated-Natural Ruby/Pink Sapphire. Comment: Heat-treated and clarity enhanced with a foreign solid filler (including bismuth).*



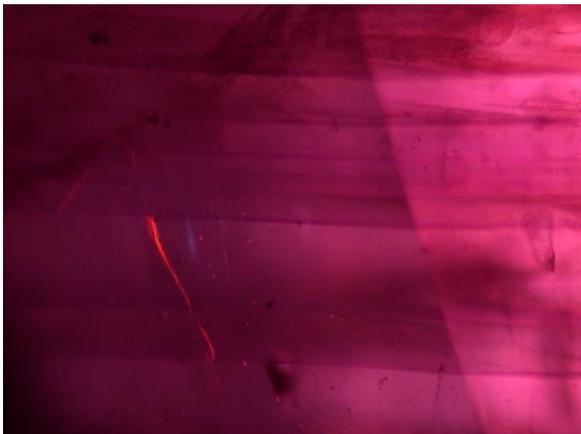
Natural pink Sapphire, clarity enhanced by a solid filler including bismuth. Rainbow flashes are seen in the microscope with fiber optic illumination or transmitted light, 60x magnification.

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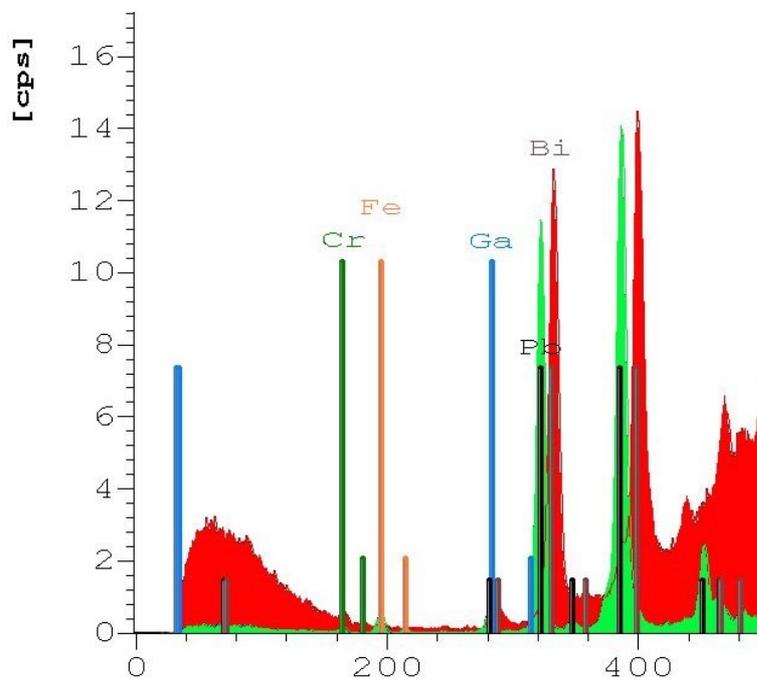
Bismuth-glass clarity treated pink sapphire with an isolated flat gas bubble trapped inside the filled crack. Microscopic image at 60x magnification.

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Natural pink Sapphire, clarity enhanced by a solid filler including bismuth. Rainbow flashes are seen in the microscope with fiber optic illumination or transmitted light, 60x magnification.

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ED-XRF analytical graphical representation of chemical composition in 2 different rubies (conditions 50KV, aluminum filter, 200 seconds measuring time) (A) In green result of chemical analysis of a lead-glass treated ruby from Madagascar. Note traces of Cr, Fe, Ga and Pb and (B) in red the result of ED-XRF analysis of a Bi-glass treated pink sapphire from Vietnam. Note traces of Cr, low Fe, Ga and Bi. Lighter elements are not measured at this experimental set up.

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