



## LAB UPDATE

### AN UNUSUAL PINK OPAL

By GIT-Gem Testing Laboratory  
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#### Preamble

Recently, GIT-GTL received an interesting orangey pink stone for identification. General observation shows that this 0.27 ct. oval faceted stone displays an orangey pink body colour and distinct play-of-colour phenomenon which is typical for an opal. (Figure 1)



Figure 1: A 0.27 ct. orangey pink opal displaying play-of-colour phenomenon (photo: Warinthip K.).

## Gemological Properties

Our basic gemological tests reveal that this stone is a singly refractive material having the RI value of 1.38. The measured SG is 1.74. It shows strong pinkish orange fluorescence when exposed to both short-wave and long-wave UV radiation. Under a microscope, this stone displays cloudy appearance on surface and showed distinct play-of-colour under reflected light (Figure 2).

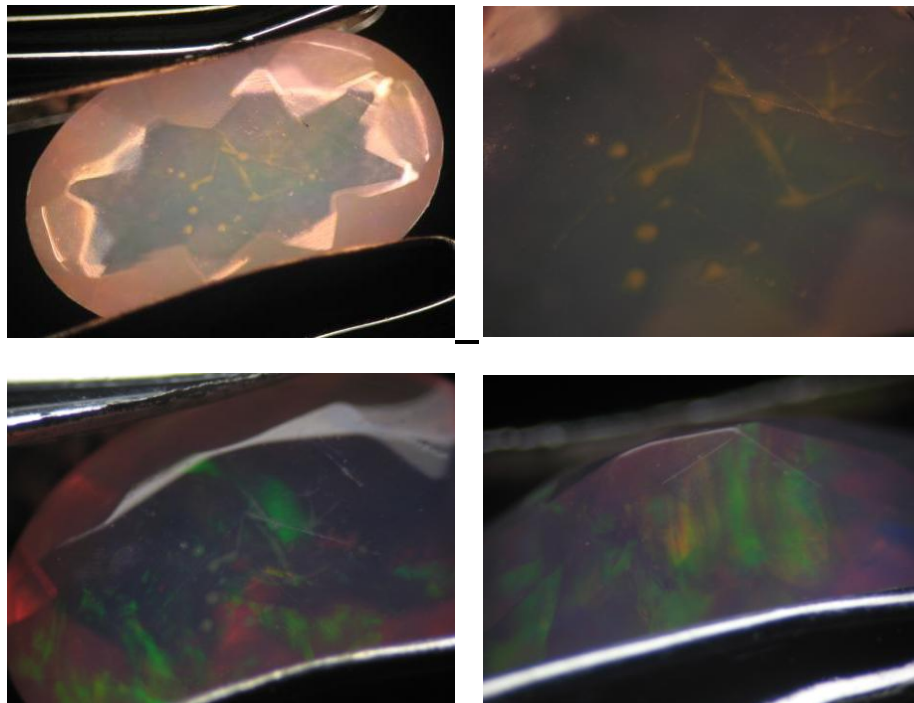


Figure 2: Photomicrographs revealing numerous colourless elongate prismatic crystals found as major inclusions in this gem material. (photo: Namrawee S.)

## Advanced Spectroscopic Analyses

The qualitative chemical analysis by EDXRF gives Si as the major component with trace amounts of Al, S, K, Ca, Sr and Zr. The FTIR spectroscopic analysis reveals a prominent absorption peak at  $\sim 5230 \text{ cm}^{-1}$  and a lower absorption band centered at  $\sim 7069 \text{ cm}^{-1}$  (Figure 3) whereas the UV-Vis absorption spectrum of this stone shows a small absorption band centered at 553.78 nm (Figure 4).

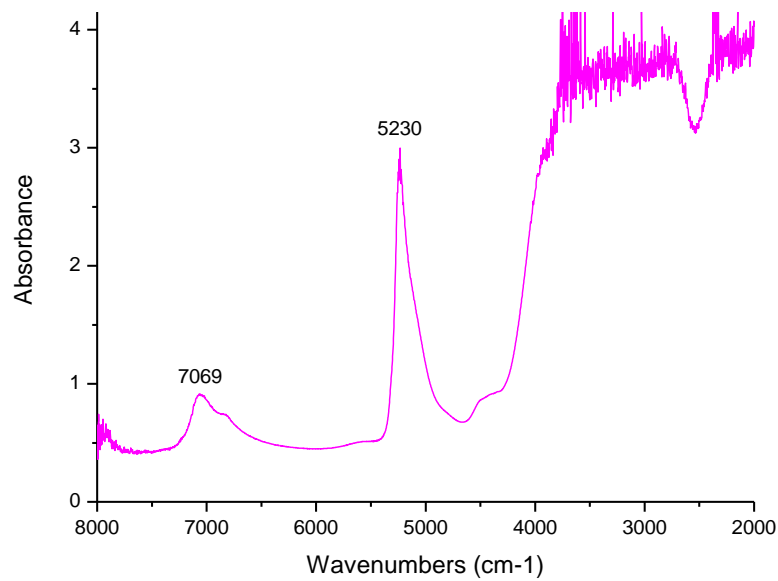


Figure 3: The Mid-IR spectrum of this sample revealed a prominent absorption peak at  $\sim 5230 \text{ cm}^{-1}$  and lower absorption band centered at  $\sim 7069 \text{ cm}^{-1}$

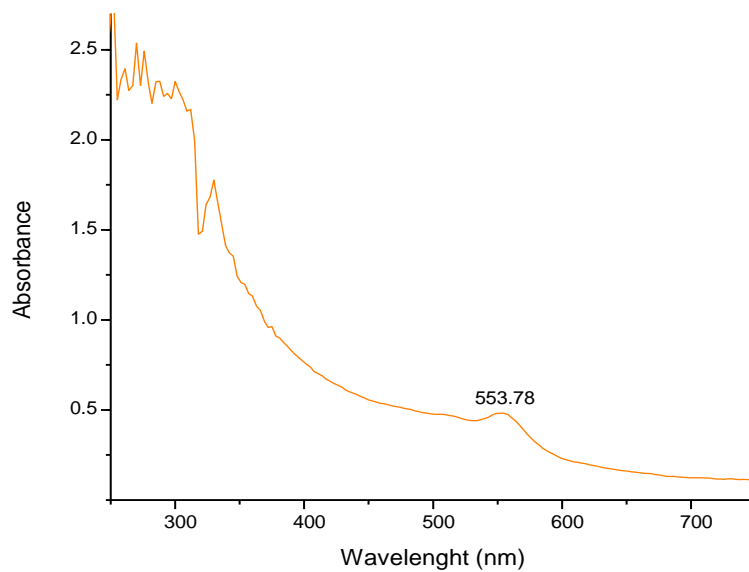


Figure 4: The UV-VIS spectrum of this sample revealed an absorption band centered at 553.78 nm

## Discussion and Conclusions

Of course, its basic gemological properties such as the singly RI value of 1.38, the SG value of 1.74, the distinct play-of-colour phenomenon and the inclusion features as well as its chemical nature of dominantly silicon constituent strongly point to the fact that this stone is a natural opal. Nonetheless, as we refer to the known literatures to date, the natural pink opal can only be found in Peru and Mexico. It is a common opal type without play-of-colour (Fritsch, 2004). This fact together with its unusual body colour and its strong pinkish orange fluorescence colour under both SWUV and LWUV lights has given us the first suspicion of its artificial coloring as these unusual characteristics are common for other dyed gem materials with similar colour. Furthermore, as we notice the presence of 553.73 nm absorption band on the UV-Vis pattern of this orangey pink opal that is similar to the UV-Vis spectrum of dyed purple opal showing two absorption features at 555 and 594 nm. (Renfro and McClure, 2011); this has given us the further evidence of dyeing treatment.

Also based on other facts that the artificially dyed opals with various colours are rarely found in the market. Until in the last several years, we begin to see many dyed opals from black to brown or any other unusual colour and in most cases, they were claimed to be treated from the Ethiopian opal (Rondeau et al., 2010). Mineralogically, the opal found in this particular locality belongs to hydrophane variety which usually is a highly porous material and could easily absorb any colouring agent into its structure. As such this type of opal from Ethiopia is suitable and commonly used for dyeing treatment. Hence, according to the above mentioned facts together with its unusual colour features and the data obtained from advanced spectroscopic analyses, we conclude that this stone is a dyed natural opal.

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### References

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- Rondeau, B. , Fritsch, E., Mazzero, F., Gauthier, J., Cenki-Tok,B., Bekele, E. and Gaillou, E. 2010. Play-of-color opal from Wegel Tena, Wollo province, Ethiopia. *Gems & Gemology*, Vol.46, No.2, pp. 90-105  
<http://www.stonegrouplabs.com/SmokeTreatmentinWolloOpal.pdf> (23/11/12)