Behind the Silk Screen: A Surprise in a Star Ruby
星光紅寶石　絲幕背後的驚訝

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筆者檢測一顆漂亮的星光紅寶石，經從多角度和在不同光源下檢視，加上儀器檢測，確認這是一顆以鉛玻璃充填的星光紅寶石。

Introduction

When I started studying gemmology, I was captivated by rutile silk. I loved its precise, orderly appearance, and symmetrical angles. While continuing gemmology classes, I found even more to appreciate: undissolved silk is a great indicator that a stone has not been heated.

As I learned more, I realized that this is not always the case. Sometimes, with lower temperature heat treatment, the silk doesn't dissolve. Still, intact silk is a clue we look for in the lab in our routine testing.

A Star-tling Submission

Recently a star ruby was submitted to our lab, and while testing it I admired its beautiful rutile silk inclusions. These short needles create a striking angular pattern in the stone, and also form its six-rayed star (Fig. 1).

Fig. 1 A star ruby that was submitted to Lotus Gemology's laboratory in Bangkok. *Photo: Lotus Gemology*
提交予曼谷Lotus Gemology實驗室檢測的星光紅寶石

This inclusion scene was so pretty that I decided to capture a photo of it (Fig. 2). It is consistent with the type of undissolved rutile silk we typically see in untreated Burmese ruby from Mogok and the surrounding areas.

In addition to these attractive clouds of silk, the stone also had other inclusions, including many

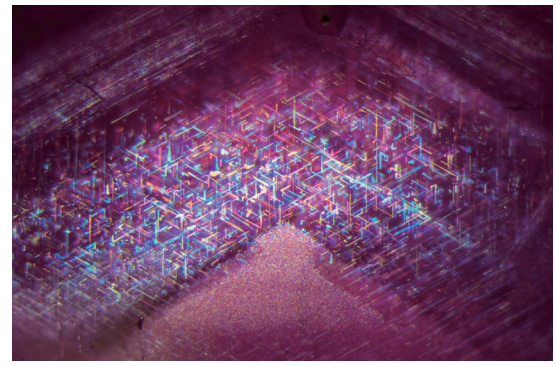

Fig. 2 Undissolved rutile silk needles in an angular pattern in the ruby. *Photo: E. Billie Hughes*
在紅寶石中呈角狀分佈的，未溶解的絲狀金紅石針。

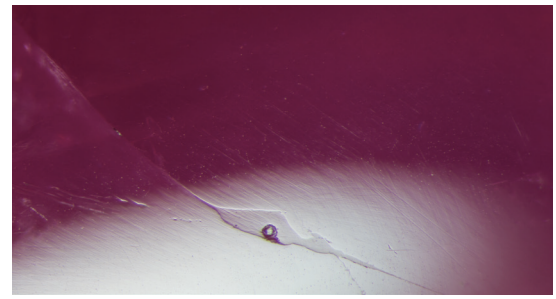

Fig. 3 This fissure is filled with a substance that shows a slightly lower lustre than the surrounding corundum in reflected light. Note that there is also a rounded area caused by a gas bubble bursting. *Photo: E. Billie Hughes*
這裂縫的充填物在反射光中較周圍的剛玉表現出稍低的光澤。要注意，還有一個由氣泡爆裂所形成的圓形區域。

fissures. I started checking for signs of oil filling and went over the surface of the stone using reflected light and a hot point. There were no signs of oil leaking out on the surface. As I looked closer, I noticed some slight differences in the lustre of some of the fissures compared to the rest of the surface of the stone (Fig. 3).

I checked the rest of the surface of the stone, where I spotted a cavity that showed a similarly lower lustre (Fig. 4).

Taking these features into account, further testing had to be done, so I ran the chemistry using our

Skyray Instruments EDX 6000B unit. The results showed that a little over 95% of the composition of the stone was Al_2O_3. In most of the ruby and sapphire we test, this figure is over 99% of the composition. What is more, over 3% of the composition was Pb (lead), confirming my initial suspicions: the stone was lead-glass filled.

There were also other characteristics to support this conclusion. Within the glass-filled portion of the cavity displayed in Fig. 4, we found one small rounded gas bubble (Fig. 5). Some of the fissures also showed irregular, flattened gas bubbles inside (Fig. 6).

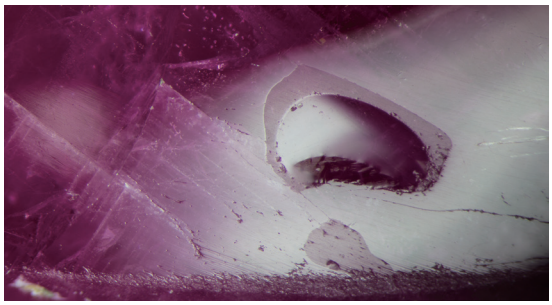

Fig. 4 This glass-filled cavity displays a lower lustre than the surrounding corundum. *Photo: E. Billie Hughes*
這個玻璃充填的空穴比起周圍的剛玉顯現較低的光澤

Fig. 5 A small, rounded gas bubble is visible in the glass-filled cavity of this glass hybrid ruby. *Photo: E. Billie Hughes*
這種玻璃滲雜的紅寶石的玻璃充填腔中可以看到一個小而圓的氣泡

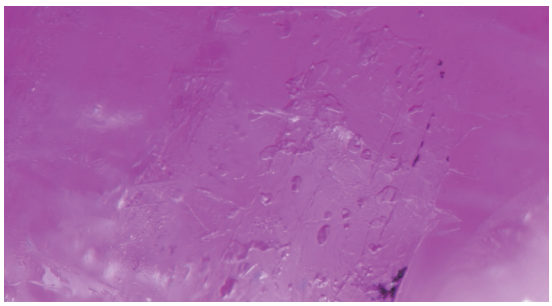

Fig. 6 Irregular flattened gas bubbles are visible in the fissure of this glass hybrid ruby. *Photo: E. Billie Hughes*
這種玻璃滲雜的紅寶石的裂縫中，可見到一些不規則的扁平氣泡

Conclusion

This case reinforces the importance of examining stones in different positions and with different types of lighting. If I had only used dark-field illumination, I may not have noticed the glass filling that was apparent in reflected light. It is also imperative that we weigh different types of evidence, as some features can be misleading. In this situation the stone had been treated at a high enough temperature to fill the fissures with glass, but not high enough to melt the silk.

I am part of several online gemmology groups, where members post images along with questions they have about their specimens. A common query is whether a stone is natural or synthetic, treated or not, often accompanied by an inclusion photo or two. Stones like this ruby have made me wary of drawing conclusions based on a photo of just one feature of a stone, and I frequently refrain from these discussions. Without the ability to conduct a thorough examination, it's easy to misidentify a specimen.

While I still love rutile silk in all its shimmering beauty, this stone was a reminder that there is no one feature or test that is diagnostic; as gemmologists we must always weigh the overall evidence and testing to confirm our results.

Acknowledgements

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