

Photomicrography Using a Smartphone Camera

Edward Boehm

While visiting mines, gem offices or trade shows, the travelling gemmologist is often challenged to come up with creative ways to identify gems and minerals using portable instruments. A few years ago, while in an office documenting some spinels that contained beautiful inclusions, I had access to a nice microscope but no SLR camera or attachment. So, I decided to try using the camera from my smartphone (iPhone) to see if I could capture the inclusions. It took a bit of practice and lots of patience, but I was able to make it work (Figure 1). Since then, I have improved the technique and also managed to take photomicrographs through a darkfield loupe (Figure 2).

When learning to take photomicrographs with a smartphone camera, it is best to start at a lower magnification and simply try to capture the entire gem in the field of view. The camera lens should be held approximately 1 cm away and directly over the centre of an ocular. Hold the camera phone as steady as possible using both hands, while using the other ocular for stability (Figure 3). If your microscope is equipped with eye shields, try resting the camera phone on a shield for stability. However, it may be easier to remove the shield if it is not positioned at the

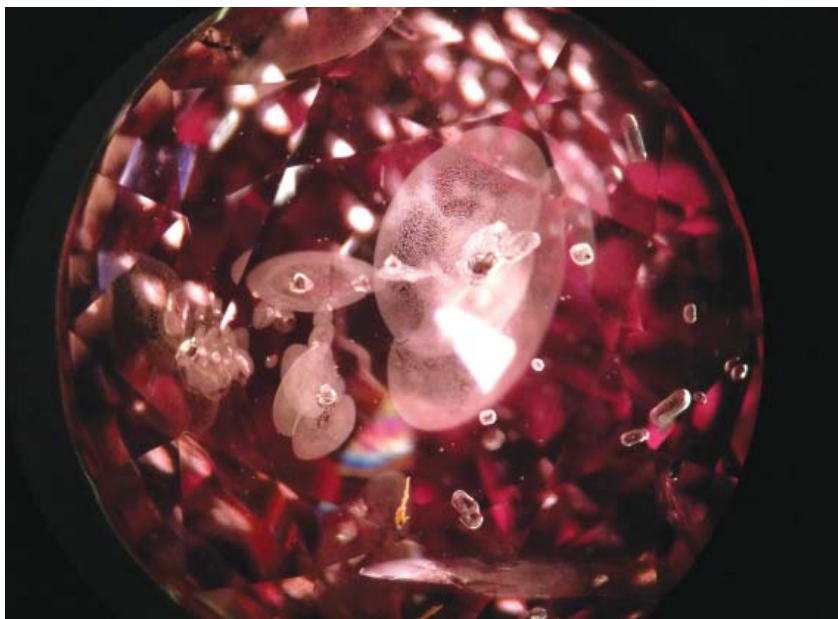


Figure 1: Viewed with a Zeiss microscope and photographed with an iPhone, these inclusions in a pink Burmese spinel consist of negative octahedral crystals with stellate clouds and rounded protogenetic apatites. A single black inclusion is also present (probably ilmenite or graphite). Photomicrograph by E. Boehm; magnified 20 \times .

Figure 2: These uraninite crystals with tension halos in a lavender Burmese spinel were captured with a 10 \times darkfield loupe and an iPhone camera. Photomicrograph by E. Boehm.

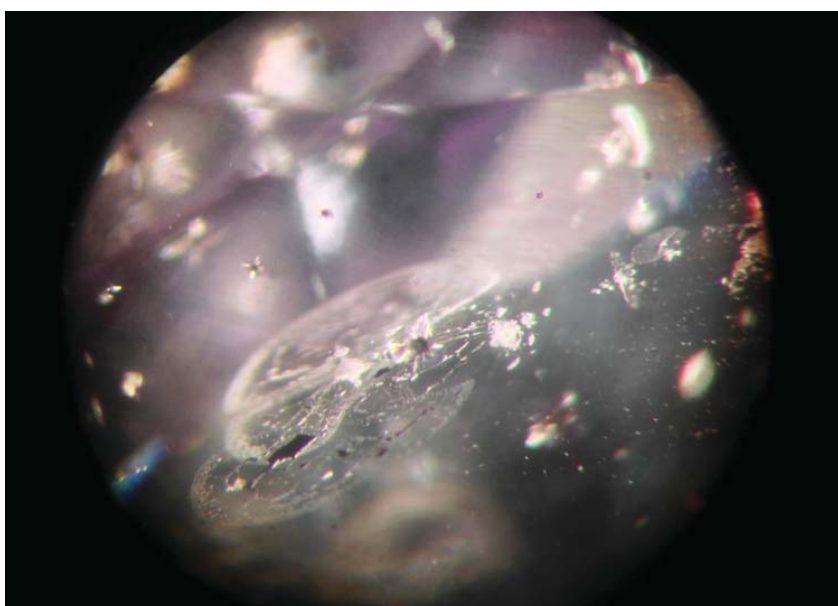




Figure 3: The author demonstrates the technique for taking photomicrographs using a smartphone camera. Here the lens of the camera is positioned over the right ocular, and the left hand is resting on the left ocular for stability. The camera lens is held approximately 1 cm above the ocular. Photo by Carley Boehm.

ideal distance from the ocular, or if it prevents the camera from being moved around until the correct image is displayed.

Tapping on the focus square and using the HDR mode should improve the picture quality. After a bit of practice, you will be able to zoom the microscope closer on the individual inclusions or surface characteristics that you wish to document. Although macro photography attachments are available for some camera phones, they should not be necessary for taking good photomicrographs using the technique described here.

While smartphone cameras cannot achieve the sharp focus or depth-of-field of digital SLR cameras, their ability to capture micro-features as well as the true colour of the host gem is exceptional. And, of course, their portability is superior. A smartphone camera should be considered one more indispensable tool in the travelling gemmologist's arsenal.

Edward Boehm GG CG
is principal of RareSource, PO
Box 4009, Chattanooga, Tennessee,
USA 37405.

Email: edward@rarsource.com

Gem-A Shop



Don't miss the **SPECIAL OFFERS**
on books and instruments from
the Gem-A Shop

Visit the Gem-A website at www.gem-a.com to discover what is on offer