

Natural History Museum

Temporary Tacky Cushioning Dots - A "Gem" of an idea

A conservation solution to a tiny display challenge

The permanent display of specimens can produce many different challenges and having to redisplay over 150 gemstones of a huge variety of sizes posed a new one. How to secure very small gems to allow the specimens to be lit but remain motionless on a base without a mount.

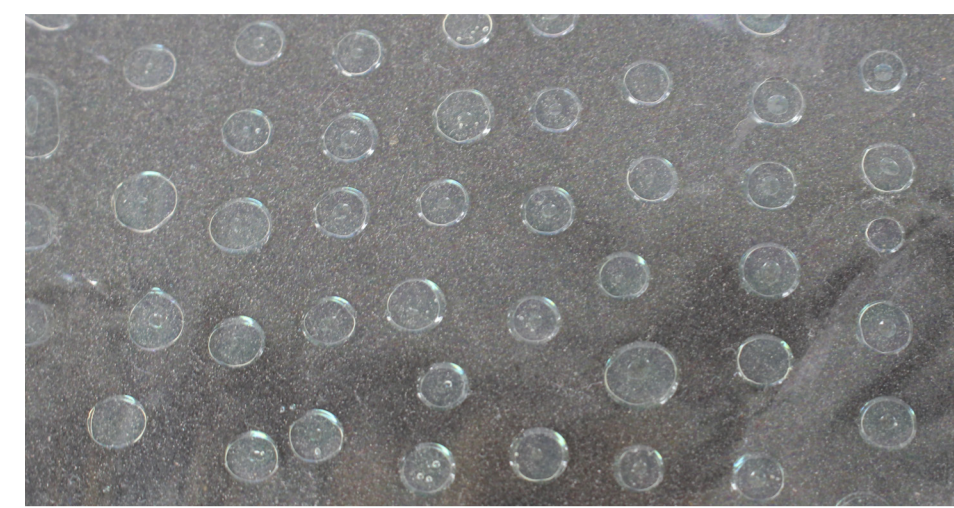
In 2018 I was given the challenge of finding a suitable methodology to semi adhere specimens to a flat base using a material that would pass Oddy testing for permanent display and be suitable to be in direct contact with the gemstone surface. As well as cushioning and semi adhering, the support also needed to be removable and transparent.

This would require the ability to use extremely small amounts of conservation grade adhesives or materials to sit beneath the smallest gemstones without having a visible impact on the display or detract from the specimen yet provide cushioning and stability. As the surface of the gemstones was reasonably robust without signs of delamination, powdering or flaking, I was able to investigate the possible use of adhesives. After carrying out tests with a range of adhesives, I decided to test Lascaux 303 HV[®], a conservation grade adhesive that is transparent with permanent tackiness.

Methodology

Lascaux 303 HV[®] was mixed in varying solutions with deionised water. The most suitable for this project being a solution of 70% Lascaux 303 to 30% deionised water. The dot needed to have a flattened dome without any peaks.

- Using a pipette to produce droplets of varying sizes, the mixture was dropped carefully onto silicone release paper. These were then allowed to air dry naturally. (Fig 1)

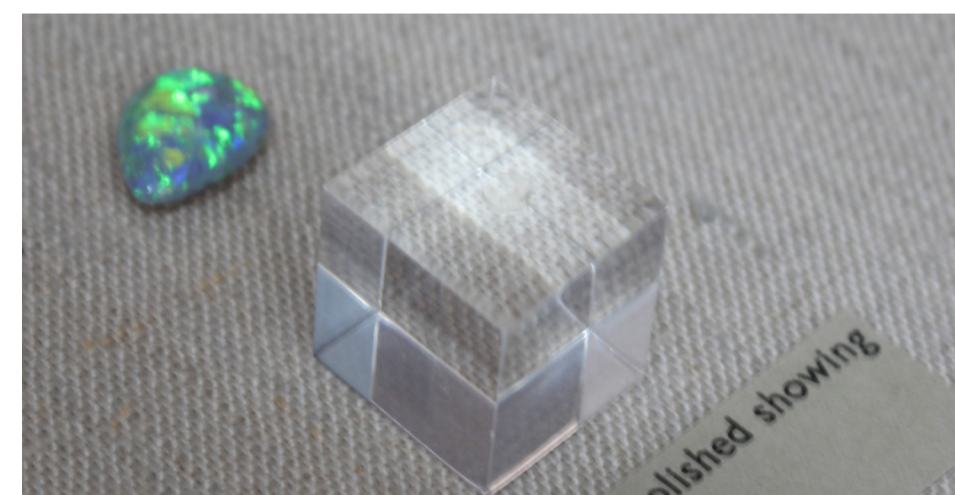


1. Lascaux 303 dots dried on silicone release paper

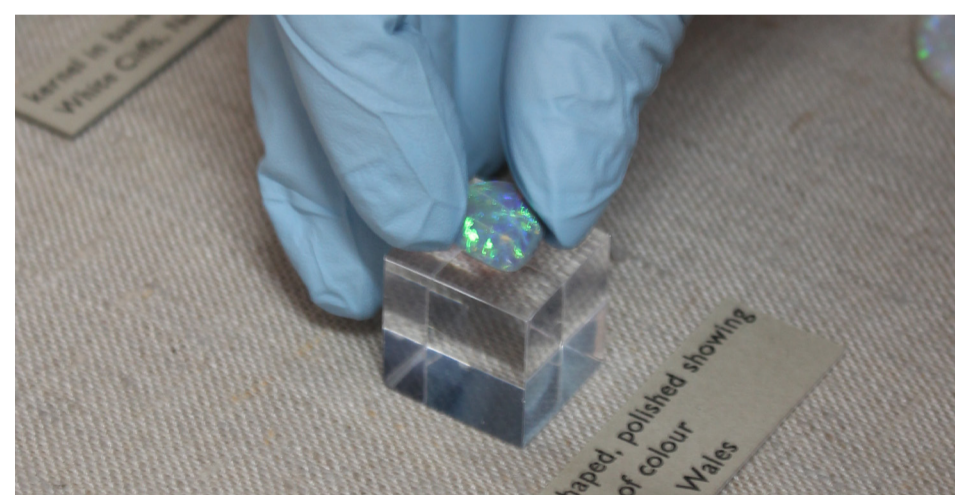
- To maintain their tackiness, a scalpel and tweezers were used to move the dots into position. (Fig 2)
- Once positioned correctly in the cases, the specimens could then be placed gently on the top of the dot. (Fig 3-5)



2. Dots being removed from silicone release paper



3. Lascaux dot positioned on perspex block mount for opal



4. Opal positioned gently on to lascaux dot to secure in situ



5. Gemstones in Earth's Treasury Gallery NHM

Additional uses

The tacky cushioning dots have been able to be utilised in other situations including ; stabilising spirit specimens on shelves and displays, keeping graphics in position in display cases, as well as for other mineral specimens and other stable materials. (Fig 6-8)

The dots were also chosen to be tested as a possible solution for mounting samples on glass slides for SEM analysis. (Fig 9)



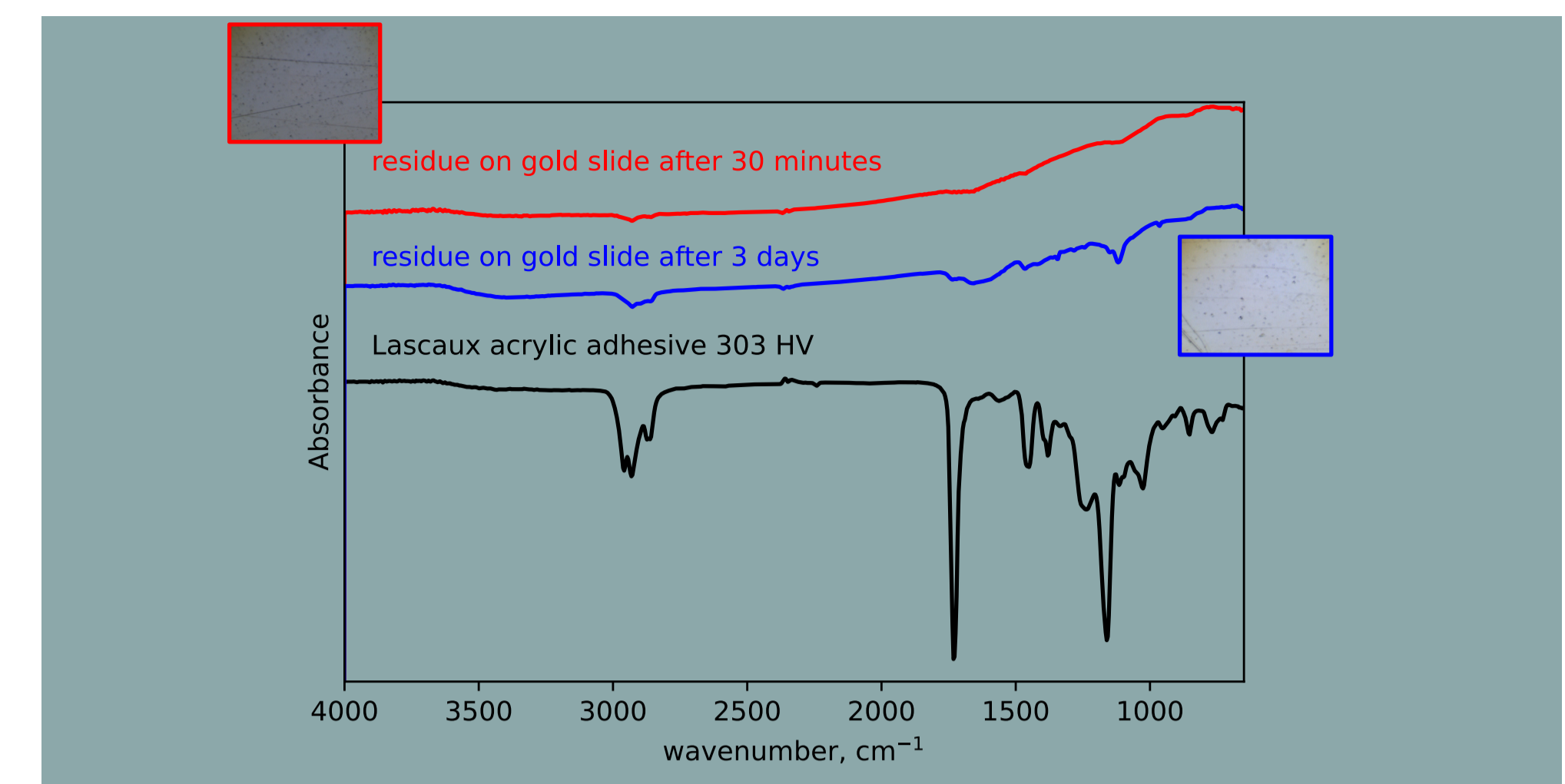
6. Lascaux dots adhered to graphic mount base



7. Lascaux dots used on base of glass spirit jar



8. Life in the Dark NHM exhibition, spirit specimens held in place with dots



9. Spectra from attenuated total reflectance--Fourier transform infrared (ATR-FTIR) spectroscopy : Summary of Lascaux 303 HV residue. Inset images are optical microphotographs of the analysis area.

Analysis

Analysis was carried out in the NHM labs using FTIR to assess if there was any residue deposited on the specimen surface. The dots were to mount and stabilise samples when being examined on glass slides for SEM.

Small dots (~5 mm diameter) of Lascaux 303 were stuck onto a gold-coated slide for varying amounts of time (0.5, 1, 3, 6, 24, 48, and 72 hrs). They were removed, the surface was photographed, and the chemical residue was measured using attenuated total reflectance--Fourier transform infrared (ATR-FTIR) spectroscopy. Spectra were collected in the NHM IAC using an iN10mx FTIR microscope (ThermoFisher) with a LN2-cooled MCT/A detector at 8 cm⁻¹ from 4000-400 cm⁻¹ with 64 scans. The aperture was 100 x 100 microns. The spectra shows a very slight residue remains.

Conclusion

The Lascaux 303 dots have proved to be successful as a mounting solution, ensuring extra stability of specimens in varying circumstances of museum displays and including assisting with graphics stability.

They should only be used with more robust surfaces that are stable, non-porous and will

not shed material as the dots will leave a slight residue. Examples include glass spirit specimen jars, robust minerals e.g. gem stones and as extra assistance with preventing movement of graphics within case displays

Further testing

After the conclusion of the FTIR results, I have decided to continue to experiment with differing proportions to see if this can reduce or remove the residue enabling this mounting/cushioning method to be incorporated into sample analysis for fossil SEM. Tests will include 50:50 mix of Lascaux 303 and deionised water and 30:70 mixture.

Acknowledgements

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