Origin Identification Characteristics of High-quality Green Jadeite

Elizabeth Su
Gemsu Rona Jewellery (Shanghai) Co., Ltd, Shanghai, China,
esu_gems@yahoo.com

Introduction

Currently occurrences of jadeite mainly include Myanmar, Guatemala, Russia, Kazakhstan and Japan. Origin has a great impact on the price of high-quality green jadeite and at present Myanmar (Figure 2), and Guatemala (Figure 1) are the main producers.

This paper deals with the characterization of jadeite from these two occurrences by chemical composition, Raman spectra, infrared spectra and UV/Vis/NIR absorption spectra.

Results

The investigation results show that the contents of Na and Al are lower in the Guatemala green jadeite compared to Myanmar material, while Ca, Mg and Fe show higher concentrations because of the presence of an omphacite component (Figure1). Myanmar material is mainly composed of jadeite (Figure 2).

Differentiation can also be carried out by Raman and infrared spectroscopy as well as optical absorption spectra.

The Raman spectrum of green jadeite from Myanmar (Figure 3) is characterized by bands at 1036, 982, 696, 372, 325 and 308 cm^{-1}. Jadeite from Guatemala shows bands at 1022, 682 and 372 cm^{-1} and additionally bands of omphacite at 401 and 345 cm^{-1}.

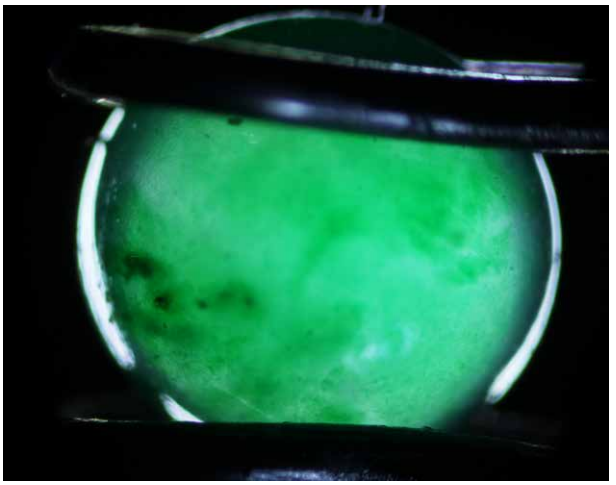

Figure 1: The black mineral (Omphacite) inclusions of Guatemala jadeite.

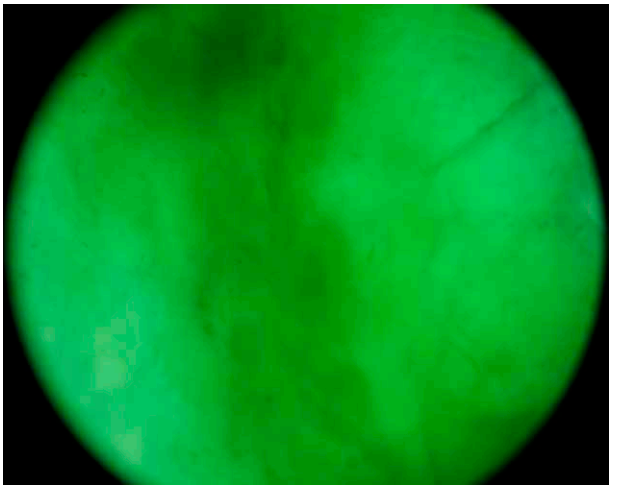

Figure 2: The structure of Myanmar jadeite under a microscope.

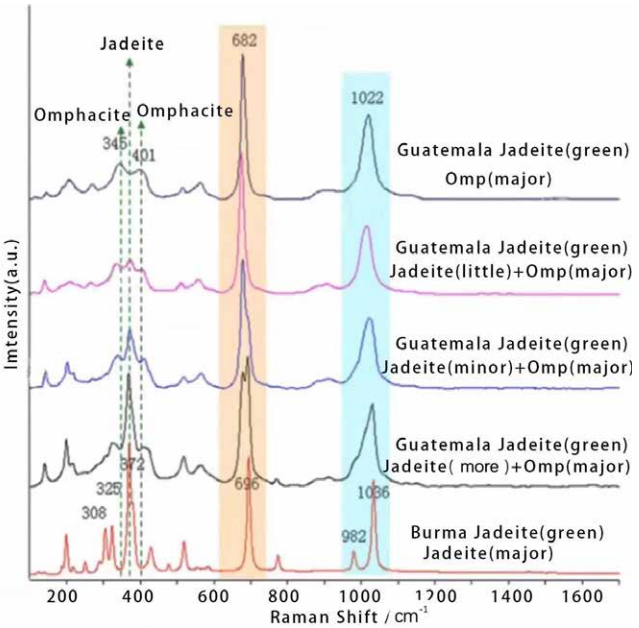

Figure 3. Typical Raman spectra of green Jadeites from Guatemala and Burma.

Conclusion

The results show that the origin of high-quality green jadeite can be effectively identified by the difference in jadeite composition and spectral characteristics.

References

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Acknowledgements

I thank Mr. Kai Zhang for supplying the Guatemala jadeite samples, Gemsu Rona Jewellery (Shanghai) Co., Ltd. for supplying the Burma jadeite samples, and Dr. Liu Xueliang from the Gemstone Testing Centre of ECUST obtained the origin determination and discussing the data for this paper.