

# User Manual for Gemstone Spectroscope

## 1. PRINCIPLE AND APPLICATION:

Gemstones have selective absorption of white light, and certain wavelengths of light are absorbed, forming absorption lines in the spectrum of the spectroscope. The selective absorption of gemstones is related to the type of coloring element they contain. By using a spectroscope, one can observe the absorption spectra of gemstone characteristics, determine the type of gemstone, inspect certain dyed gemstones or gemstones, and distinguish between natural gemstones and synthetic gemstones.

## 2. INSTRUMENT CLASSIFICATION:

Instruments are divided into prism spectrometers and grating spectrometers.

### ①. Grating spectroscope:

The spectral color regions are roughly equal, with relatively high resolution in the purple region and narrow resolution in the red region;

### ②. Prism type spectroscope:

The spectral color range is uneven, with relatively good resolution in the red region and narrow resolution in the purple region.

## 3. OBSERVATION METHOD:

①. **Transmission method:** mainly for large gemstones, with a more obvious observation in the waist direction;

②. **Internal reflection method:** The gemstone table is facing downwards, allowing light to enter the interior of the gemstone at an oblique angle, generating reflection, and using the reflected light for observation.

## 4. OPERATION SEQUENCE:

①. Select reflected light or transmitted light for testing based on the sample situation;

②. Fix the sample so that the light spot is located at the point to be observed.

③. Adjust the height and tilt angle of the spectroscope to allow the reflected or transmitted light of the sample to enter the tube.

④. Observe the wavelength (line) or wavelength range (band) of the region where the absorption spectral line or band is located.

## **5. ATTENTION:**

- ①. The sample is too small, making it difficult to measure the absorption spectrum;
- ②. When the sample is opaque, the absorption spectrum cannot be observed;
- ③. Due to changes in sample origin, color, and other factors, not all samples of the same type can see standard absorption spectra;
- ④. When the absorption spectrum data of the measured sample does not match the standard value, it is not considered an important identification item;
- ⑤. When selecting instruments, please choose the appropriate spectroscope style based on the test variety for easy observation;
- ⑥. After use, please place the instrument in a dust-free and dry location to prevent dust from entering the narrow slit and affecting its lifespan.