What is Fluorescence?

Fluorescence is the term for the emission of light when exposed to ultraviolet light. There are several factors that may cause fluorescence in a gem: impurities, flaws in the structure of a crystal lattice, and the presence of iron. Different gems will fluoresce different colors, and many will not fluoresce at all. For example one diamond may fluoresce blue, and another not, and an emerald may fluoresce red.

In Koser's gem lab, we have an ultraviolet light that emits both short wave, and long wave ultraviolet lights. You will want to be careful if you are viewing gems under a UV source; your eyes should be protected. We use UV Light in the identification and grading of various gems.

Here is an excerpt from an issue of Gems and Gemology which you may find interesting.

The Impact of Fluorescence in Diamonds: A Different Research Perspective

William E. Boyajian

The effect of ultraviolet fluorescence on diamond appearance has been hotly debated for at least the past decade. Opinions of even the most experienced tradespeople vary widely. With great conviction, some say that blue fluorescence of different strengths typically enhances a diamond's overall appearance. Others, as convincingly, say that it has a negative effect. To address this controversy, researchers at the GIA Gem Trade Laboratory conducted an experiment on the effects of long-wave ultraviolet radiation on the color appearance and transparency of gem diamonds. Their results are reported in this issue.

This study challenges the perception held by many in the trade that UV fluorescence generally has a negative effect on the overall appearance of a diamond. In fact, the results support the age-old belief that strong or even very strong blue fluorescence can improve appearance rather than detract from it, especially in diamonds with faint yellow body color. This result is consistent with the slightly higher 'asking' prices reported for these stones. While the apparent benefits of blue fluorescence are less obvious in colorless to very near-colorless diamonds, they still were evident in the study. This should bring into question the trade's lower 'bid' prices for moderate to highly fluorescent diamonds in the better colors. It also makes us question the source of the present controversy surrounding fluorescent diamonds. It may be the result of trademembers' misunderstanding of the complexity of the issue, or the extreme price sensitivity in the highest color grades (where there are fewer stones and distinctions are more subtle). Or it may be the fact that it is simply easier to move goods without the encumbrance of a reported fluorescence.