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A BLUE-UV ABSORBING FILTER FOR LABORATORY ILLUMINATION

S. R. Sutton and D. W. Zimmerman
Center for Archaeometry
Washington University
St. Louis, MO. 63130

In the preparation of TL samples, it is important to avoid the optical effects of laboratory illumination. Exposure to room light can both induce and bleach stored TL in many minerals, blue-UV light being more effective than red. These effects can be avoided by preparing samples in subdued light with as little blue-UV component as possible. Lighting of this kind can be obtained from red blubs, red fluorescent tubes or white fluorescent tubes fitted with blue-UV absorbing filters. In the latter scheme, it is possible to obtain illumination which more closely approximates normal white lighting and, therefore, creates a more comfortable working environment. We report here on a suitable fluorescent tube filter.

UV absorbing filters for fluorescent tubes are offered by Solar Screen Co., 53-11 105th St., Corona, New York 11368. They are available in clear and amber (cost: $28 for twenty-four 48-inch long jackets). We have measured transmission spectra (Fig. 1) using a Cary spectrophotometer and have found the amber to be preferred because of its better absorption of blue light.

The effect of the amber light and sunlight on stored TL was measured for five geologic minerals: quartz, microcline, labradorite, zircon and apatite. Each mineral was powdered, annealed, and irradiated. The TL response was then measured for three aliquots; one exposed to sunlight, one exposed to amber light and a "control" aliquot which was kept dark. The change in stored TL due to exposure to the light was expressed as a percentage of the "control" TL. Use of the "control" aliquot for normalization corrects for thermal decay and anomalous fading. Table 1 shows the results for the five minerals.

An amber light exposure of 130 lux.hours produced a maximum change in stored TL of 10%. For the TL of all five minerals to change less than 1%, the sample exposure must be less than about 10 lux.hours. The length of time to receive this exposure depends, of course, on the illumination level in the room. We find a tabletop illumination of about 10 lux of amber light to be satisfactory. (Uniform illumination is best obtained with indirect lighting.) In this case, samples should not be exposed for more than one hour. As a further safeguard, we recommend that each fluorescent tube be filtered with at least two amber jackets to further reduce blue light.

FIG. 1
"SOLAR SCREEN" TRANSMISSION SPECTRA

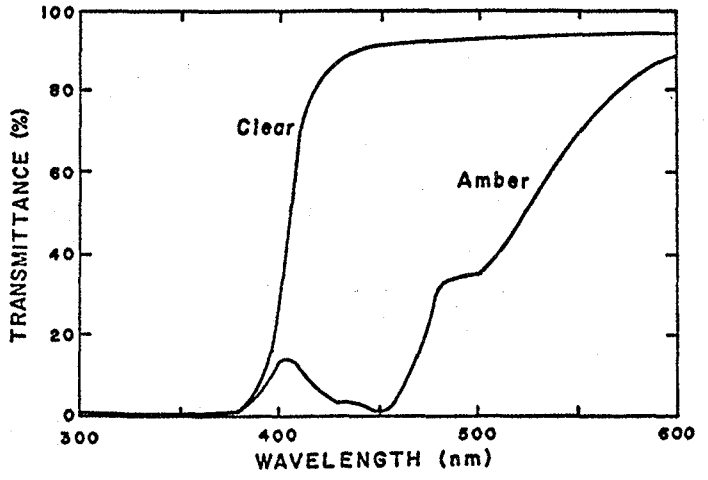

TABLE 1

Percentage Change in TL at 350°C in Glow Curve

Sample	Sunlight through glass (40,000 lux.hrs.)*	Amber light (130 lux.hrs.)*
Quartz	-71	-6
Microcline	-69	-8
Labradorite	-48	+10
Zircon	-91	-3
Apatite	-90	-3

* exposure measured with Gossen exposure meter