5.4.2: Lecture Demonstrations

The Wave Nature of the Electron Lecture Demonstrations

Energy is Proportional to Frequency

Commercial Photoelectric Effect Demonstrators are excellent for this purpose, but if one is not available:

Tape a piece of plastic diffraction grating to the lens of an overhead projector, as in Figure, and place an opaque cover on the Fresnel lens as shown, to project a continuous spectrum.

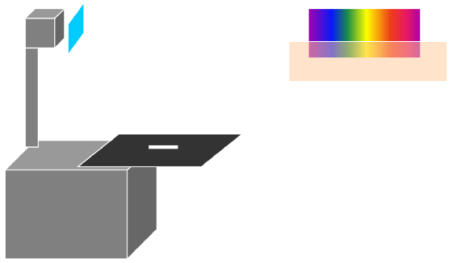

Illustration of a board with a cut out diffraction grating in the center. This board is placed on the lens of a projector. The projecting lens is covered with an opaque film. The resulting spectrum has a continuous spectrum of all the rainbow colors. Red is on the right end and violet is on the left end.

Projecting a Spectrum

On the wall, tape a piece of phosphorescent sheeting [1] protected from room lights with a cover made from file folders (etc).

Dim the room lights, and project the spectrum on the phosphorescent material as shown. After several seconds, turn off the projector, and observe that the greatest phosphorescent intensity is below the visible range.

Electric Pickle Demonstrations[2]

Use metal forks connected to the AC output of a Variac to excite the sodium wavelength in a dill pickle.

References

1. ↑ www.teachersource.com/Chemist...inylSheet.aspx
2. ↑ J. Chem. Educ., 2005, 82 (4), p 545