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**Student Activity- Electron Spectroscopy**

**Learning Objective** **SAP-8.A** Explain the relationship between a region of the electromagnetic spectrum and the types of molecular or electronic transitions associated with that region.

**Science Practice 4.A** Explain chemical properties or phenomena (e.g., of atoms or molecules) using given chemical theories, models, and representations.

**QUESTION:** What does electron spectroscopy tell us about transitions in electronic energy

levels and electronic structure within atoms?

Observe what happen when a Hydrogen Spectrum Tube is inserted into a transformer box (power supply). What does the spectrum tube look like when the power is turned on? What do you see using the spectroscopic glasses with diffraction gratings in them?

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Observe what happen when a Mercury Vapor Spectrum Tube is inserted into a transformer box (power supply). What does the spectrum tube look like when the power is turned on? What do you see using the spectroscopic glasses with diffraction gratings in them?

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Explain what causes the different bands of color in each observation you made. Why do mercury and hydrogen have different color bands? What does that tell you about the electronic structure of these atoms?

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When electrons get excited, they give off radiation in the ultraviolet/visible spectrum. What type of radiation is associated with transitions in molecular vibrations?

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