

Results #3—Spectroscopy

Name _____

Part I

1. What is the identity of the metal in your 'unknown' salt solution? Be sure to note the letter of your unknown and justify your answer.

Letter of unknown: _____ Metal: _____

Justification:

Part II

2. Light is produced in different ways in this experiment (i.e. fluorescence and blackbody radiation). For each type of lamp listed, write the method of light production for that lamp:

a) Elemental lamps _____

b) Incandescent lamp _____

c) Half-coated fluorescent lamp _____

3. Which gas (of the 4 you observed in elemental lamps) is present in the half-coated fluorescent lamp? _____

Justify your answer, based on your experimental observations:

Typical fluorescent lights that are used for lighting have a phosphor coating, like the half-coated bulb that you observed. What does the phosphor coating do, and how does this increase the visible light output?

Part III

Attach spectra

What solute did you use? _____

What color was the solution? _____

4. What color(s) were absorbed your colored solution? _____

What color(s) were transmitted by your solution? _____

5. How does the chemistry in Part 3 differ from the chemistry seen in Part 2? Hint:
They differ in two ways.

6. List peak wavelength (λ_{\max}) and peak absorption (A_{\max}) values for the solution that you measured. Also list estimates of the values you would expect if you diluted the solution by a factor of two:

| | λ_{\max} | A_{\max} |
|------------------------------------|------------------|------------|
| Undiluted sample (measured values) | | |
| Diluted sample (expected values) | | |

Compare and contrast.

Part IV

7. For each spectrum, predict what color the filter would appear based on the absorption spectrum given to you.

COLOR IT WOULD APPEAR

Spectrum 1: _____

Spectrum 2: _____

Spectrum 3: _____

Spectrum 4: _____