**Determining Concentration Worksheet**

Fill in this table with the reflected light values for standards A-G and the two unknown samples.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Sample** | **Concentration (drops/20 ml)** | **Reflected light (%)** |
| **Standards** | A | 50 |  |
| B | 30 |  |
| C | 20 |  |
| D | 10 |  |
| E | 5 |  |
| F | 1 |  |
| G | 0 |  |
| **Unknowns** | 1 | ? |  |
| 2 | ? |  |

**Plot the reflected light values for the standards versus the concentration below.**

**Instructions for determining the concentrations of your unknown solutions:**

1. Plot a straight line through as many of the points that you plotted for the standards as you can. Use a ruler to draw a line that best fits the data. Look at all the points and line up the ruler so that some of the points fall above the line, and some below. Draw a single line that that passes through the *middle* of the points.
2. Locate the reflected light value for Unknown 1 on the y-axis. Match it to the location on the standards line; then see what the corresponding concentration is.

Concentration of Unknown 1: drops/vial

Repeat for Unknown 2.

Concentration of Unknown 2: drops/vial

**Answer the following questions.**

1. Determine the percent change between the reflected light value of Standard A and Standard D.

$$percent change= \left(\frac{\left|Reflected light \_{Standard A}-Reflected light\_{Standard D}\right|}{Reflected light \_{Standard A}}\right) x 100$$

1. Determine the percent change between the concentration of Standard A and Standard D.

$$percent change= \left(\frac{\left|Concentration \_{Standard A}-Concentration\_{Standard D}\right|}{Concentration \_{Standard A}}\right) x 100$$

1. Compare your answers to questions 1 and 2. What do you notice?
2. The actual concentration for Unknown 1 is **15 drops/cuvette**, and the actual concentration for Unknown 2 is **40 drops/cuvette**.

Calculate the *percent error* for the concentration you determined for your Unknowns. Use the following formula:

$$percent error= \left(\frac{\left|experimental-actual\right|}{actual}\right) x 100$$

Unknown 1 Unknown 2