Pre-Lab Questions

The following data was obtained from the testing of Lemon-Lime Gatorade.



|  |  |  |  |
| --- | --- | --- | --- |
| Solution | Dilution Ratio  ml stock/ml water | Concentration μM | Absorbance |
| Stock | 10 ml/0 ml | 27.8 | .759 |
| 2 | 8 ml /2ml | 22.2 | .588 |
| 3 | 6 ml/4 ml | 16.7 | .451 |
| 4 | 4 ml/ 6ml | 11.1 | .299 |
| 5 | 3 ml/7 ml | 8.34 | .223 |

1. Using the Beer’s Law Graph above answer the following: A sample of Lemon-Lime Gatorade had an absorbance of 0.31. What is the concentration of FD&C Yellow 5 dye ?

2. Determine the mass of FD&C Yellow 5in a 1.0 Liter sample of Lemon-Lime Gatorade. The molar mass of FD&C Yellow 5 is 534 g/mole

Hint: Use the concentration above to determine the number of moles.

M = moles of solute / Liters of solution MM = grams given/ moles

**Use the following for your upcoming Laboratory Investigation.**

The visible absorption spectrum for FD&C Blue 1 is shown in Figure 6.



3. What would be an optimum wavelength for measuring the absorbance versus concentration of a series of FD&C Blue 1 dye solutions? Explain your answer. Absorbance measurements are most accurate and sensitive in the range of 0.2-1.0.

4. To construct a calibration curve, a series of known concentration standards is prepared. Using the estimated concentration of the FD&C Blue 1 stock solution, determine the concentration of each of the following dilutions.

**These solutions will be used in your upcoming Laboratory Investigation.**

M1V1 = M2V2

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Dye Stock Solution (A) | B | C | D | E | F | G | H |
| Concentration (μM) | 7.0 |  |  |  |  |  |  |  |
| Water (ml) | 0 | 2 | 4 | 6 | 7 | 8 | 9 | 10 |
| Stock solution (ml) | 10 | 8 | 6 | 4 | 3 | 2 | 1 | 0 |