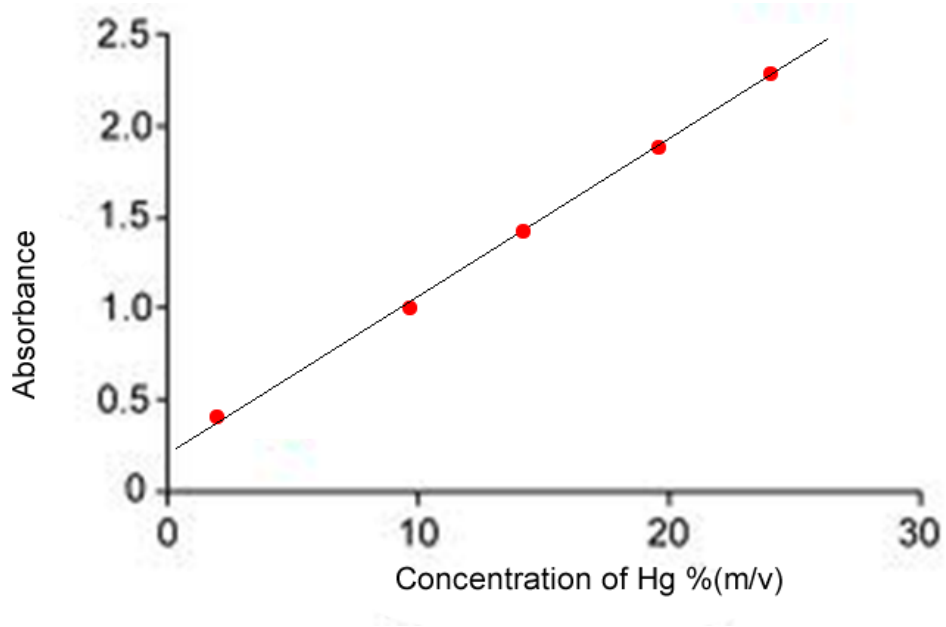
Friday Worksheet **Name: …….**
UV-visible spectroscopy 1

1) Food important routinely undergoes analysis. A 2.15 kilogram sample of black berries was analysed for heavy metal content, namely mercury. The sample was crushed and dissolved in 20.0 mL of 0.152 M HCl. The resulting solution was filtered into a 250 mL volumetric flask and thoroughly washed with distilled water. The solution in the volumetric flask was made to the mark by the addition of distilled water.
A 5.00 mL aliquot was taken from the volumetric flask and mixed with 15.0 mL of a 0.135 M sodium dithizonate ($C_{26}H_{22}N_8Na_2$) solution. A 2.00 mL sample of this final solution was then analysed using UV-visible colorimeter. The absorbance of this sample was measured at 1.50.

A calibration curve was previously constructed as shown below.



a) What is the concentration of Hg of the 2.00 mL sample tested in the colorimeter?

b) Calculate the mass of Hg in the volumetric flask?

c) Calculate the % m/m of Hg in the berries

d) Why does the calibration curve not pass through the origin?

e) Both AAS spectroscopy and UV-Visible spectroscopy are used for analysis of solutions via absorption of electromagnetic radiation. How are they different?