

Chemguide – answers

UV-VISIBLE SPECTROSCOPY – IN ANALYSIS

1. a) There are two problems. First, you would expect the law to give an absorbance which is directly proportional to the concentration across the whole concentration range. That isn't actually true, and so the equation can't be relied on. Secondly, it means that you have to find a value for ϵ for the substance you are studying and at the wavelength that you are choosing. That may not be easy.

b) First, make up a number of solutions containing potassium manganate(VII) of known concentration, some a bit more dilute than the one you are testing, and some a bit more concentrated. You can just do this by looking at the colours as long as you know the actual concentrations.

Then measure the absorbance of each of your known solutions, and plot a graph of absorbance against concentration.

Finally, measure the absorbance of your solution of unknown concentration, and use the graph to find its concentration.

c) You don't need to find a value for ϵ . It doesn't matter if the graph is a straight line or a curve – once it is plotted, you can easily find the unknown concentration whatever the line looks like.