

Spectrophotometry questions - answers

1) The sensitivity of an absorbance spectrophotometer was adjusted to give absorbance of 1.00 for a known concentration of $0.26 \text{ mmol dm}^{-3}$. Calculate the concentration of a sample which then records an absorbance of 0.76. **$0.198 \text{ mmol dm}^{-3}$**

2) A solution with a known concentration equal to 3.4 mmol dm^{-3} gave an absorbance reading of 0.820 in a spectrophotometer. What absorbance reading would be obtained for a solution with a concentration 2.6 mmol dm^{-3} ? **0.627**

3) A solution of concentration $0.046 \text{ mmol dm}^{-3}$ records an absorbance reading of 0.893. In a dilution, 5 cm^3 of this solution was pipetted and then made up to 100 cm^3 . Calculate the absorbance reading that would be obtained with the final solution. **0.0447**

4) A solution of quinine with a known concentration of $0.164 \text{ } \mu\text{g cm}^{-3}$ gave a reading of 82.0 in a fluorescence spectrophotometer. A sample of tonic water was diluted 1:200 and then gave a reading of 56.8 in the same spectrophotometer. Calculate the concentration of quinine in the original tonic water. **$22.7 \text{ } \mu\text{g cm}^{-3}$**

5) A spectrophotometer gives an absorbance reading of 1.0 for a concentration of $0.56 \text{ mmol dm}^{-3}$. A solution of concentration 3.6 mol dm^{-3} can be diluted in several operations, with each operation having a dilution of 1:20. How many dilutions should be made so that the concentration of this solution can be calculated within a range of 0.0 to 1.0 ? **3**

$C_s =$

$A_s =$

$C_0 =$

$A_0 =$