**POGIL ACTIVITY**

1.Which of the following relationships between absorbance and %Transmittance

is **incorrect** ?

a) A = log10 100 / %T  
b) A = 2 - log10 %T  
c) A = log10 1 / %T

2.In the equation, A = ****bc, what quantity is represented by "****" ?

a) Absorbtivity  
b) Molar absorbtivity  
c) Path length

3.Why is it generally preferable to use absorbance as a measure of absorption

rather than % Transmittance?

a) Because %T cannot be measured as accurately as absorbance  
b) Because %T is dependant on the power of the incident radiation  
c) Because absorbance is proportional to the concentration of the analyte,

whereas %T is not.

4. Does a compound with high molar absorbtivity have a higher or lower limit of

detection than a compound with low molar absorbtivity?

5. How does the percent transmittance of a solution vary with (a) increasing

concentration and (b) increasing path length?

**Numerical Problems:**

1) A solution of Tryptophan has an absorbance at 280 nm of 0.54 in a 0.5 cm length cuvette. Given the absorbance coefficient of tryptophan is 6.4 × 103 LMol-1 cm-1 . What is the concentration of solution?

2) A solution shows a transmittance of 20%, when taken in a cell of 2.5 cm thickness. Calculate its concentration, if the molar absorption coefficient is 12000 dm3/mol/cm.

3) Calculate the molar absorptivity of a 1 x 10 -4 M solution, which has an absorbance of 0.20, when the path length is 2.5 cm.

4) The concentration of yeast t-RNA in an aqueous solution is 10 M. The absorbance is found to be 0.209 when this Solution is placed in a 1.00 cm cuvette and 258 nm radiations are passed through it. a) Calculate the molar absorptivity b) What will be the absorbance if the solution is 5 M? c) What will be the absorbance if the path length of the original solution is increased to 5.00 cm?

5) A CaCO3 solution shows a transmittance of 90%, when taken in a cell of 1.9 cm thickness. Calculate its concentration, if the molar absorption coefficient is 9000 dm3/mol/cm.

6) The absorbance of a Cu sulphate solution containing 0.500 mg Cu/mL was reported as 0.3500 at 440 nm. a) Calculate the molar absorptivity, on the assumption that a 1.00 cm cuvette was used. b) What will be the absorbance if the solution is diluted to twice its original volume.