

## CONCEPT ORGANIZER 2 - CHAPTER 2

Concept	Reading	Short Answer or Equation
<b>The spectrochemical measurement process</b>	T13-15, Fig. 2-1	
<b>Definitions of spectrochemical methods - emission, absorption, photoluminescence</b>	T19-22, Tab 2-3	
Q. What is the primary difference between emission and photoluminescence techniques?		
Q. The intensity of emission (emission radiant power) for a particular transition of a given atom heated in a hot plasma depends on the number density of the excited state and what parameter that describes the strength of the transition (hint: the units are $s^{-1}$ )		
Q. The photoluminescence process depends on two basic steps. If excitation is efficient, why might not any emission be observed?	T25	
Q. In Beer's law, which variable is dependent on the analyte and wavelength?	S4-1	
<b>Wavelength selection</b>	T22-23	
Q. What is the difference in the number of slits between a monochromator and a polychromator?		
Q. In a spectrograph, the slit in the focal plane is replaced by what?		
<b>Readout expressions and symbols</b>	T24-26, S2	

Q. What the primary background signal(s) in a) emission measurements, b) photoluminescence measurements?		
Q. What are the minimum number of measurements need to determine the transmittance of a sample?		
<b>Boltzmann distribution</b>	T19, S3	
Q. State the Boltzmann formula		
Q. For electronic transitions, the partition function is normally approximated as being equal to what dimensionless parameter.		
<b>Optical intensity &amp; radiometric Units</b>	T15-19, Tab 2-1	
Q. State the formula to calculate the solid angle		
Q. Half a sphere corresponds to how many steradians?		
Q. If a surface is oriented at 45 degrees relative to an observer, the projected area is what fraction of the real area?		
Q. State the name and symbol of the term used to describe the intensity of a point source		

Q. State the name and symbol of the term commonly used to describe the intensity of an extended source		
Q. If the radiant power in Watts is known, how can it be converted to photons/s?		
Q. State the formula to convert wavelength to frequency		
Q. If the wavelength doubles, the frequency is the same, twice, or one half the of original frequency?		
Q. State the formula to convert a wavelength interval to a frequency interval		
Q. If the wavelength doubles for a given wavelength interval, the frequency interval is the same, twice, four times, $\frac{1}{2}$ , or $\frac{1}{4}$ of the original frequency interval?		
Q. If the spectral radiant power in W/Hz is constant from 300 to 600 nm, the radiant power in W/nm at 600 nm is the same or a factor of 4, 2, 0.5 or 0.25 of that at 300 nm?		
Q. With a spreadsheet, make and attach a figure with a curve of frequency versus wavelength from 200 to 800 nm. On the same figure, plot frequency interval versus $\lambda$ for a constant 1-nm wavelength interval.		