Announcements – Lecture VI – Tuesday, May 27th

1. **First Lab:**   **Today, 1:30-4:30, ISB 155**

2. **Second Lab:**   **Thursday, May 29th, ISB 155 (A-C)**

3. **Exam I:**   **Friday, May 30th – In Class**

Last Name: _____

C: 12.01   H: 1.01   O: 16.00

A compound is found to contain **39.99** % carbon, **6.727** % hydrogen, and **53.28** % oxygen by weight. **Determine the empirical formula of this compound?**

The molecular mass for this compound is 180.18 g/mol.. **Determine the molecular formula of this compound?**

C	H	O
39.99 g	6.727 g	53.28 g
3.329 mol	6.660 mol	3.330 mol
$\frac{3.329}{3.329}$	$\frac{6.660}{3.329}$	$\frac{3.330}{3.329}$
1	2.001	1.000
1	2	1

CH_2O

$CH_2O:\ 12.01+2(1.01)+16.00$
$=\ 30.03\ g.mol$

$\dfrac{180.18\ g.mol^{-1}}{30.03\ g.mol^{-1}}=6$

$C_6H_{12}O_6$

3.3b Balancing – Example_1

Balance the following chemical equation:

$$\underline{2}\ Fe_2O_3(s) + \underline{3}\ C(s) \quad = \quad \underset{4}{\underline{\cancel{2}}}\ Fe(s) + \underline{3}\ CO_2(g)$$
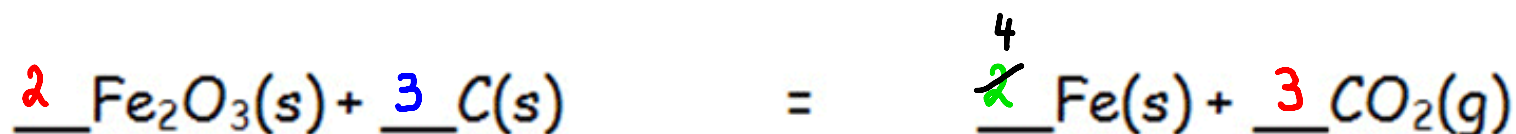
Reactants					✓
Fe	2	2	4	4	4
O	3	3	6	6	6
C	1	1	1	1	3

Products					✓
Fe	1	2	2	4	4
O	2	2	6	6	6
C	1	1	3	3	3

$$2\ Fe_2O_3(s) + 3\,C(s) \quad = \quad 4\ Fe(s) + 3\ CO_2(g)$$

3.3b Balancing – Example_2

Balance the following chemical equation:

$$\_\_C_2H_6(g) + \frac{7}{2}\_\_O_2(g) \quad = \quad \underline{2}\_\_CO_2(g) + \underline{3}\_\_H_2O(l)$$
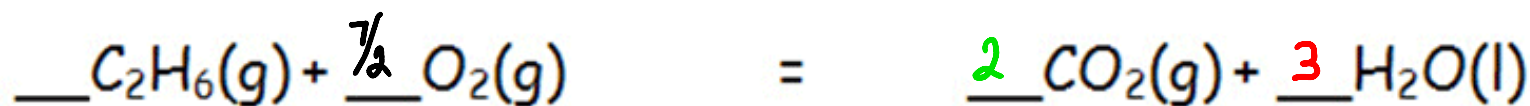
Reactants		✓		
C		2	2	2
H	6	6	6	6
O	2	2	2	7

Products			✓		
C	1	2	2	2
H	2	2	6	6
O	3	5	7	7

$$C_2H_6(g) + \tfrac{7}{2}O_2(g) \ = \ 2\,CO_2(g) + 3\,H_2O(l) \qquad \stackrel{\cdot\cdot}{\frown}$$
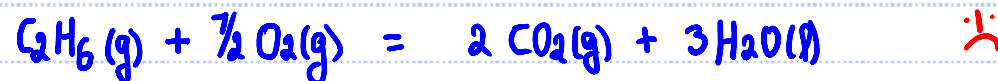
"Convert to the smallest whole integer values"

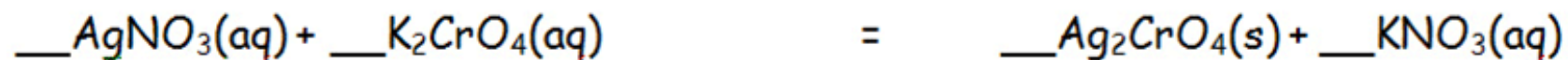$$2\,C_2H_6(g) + 7\,O_2(g) \ = \ 4\,CO_2(g) + 6\,H_2O(l) \qquad \ddot{\smile}$$

3.3 Stoichiometry and Chemical Reactions
b) Balancing Chemical Equations

3.3b Balancing – Example_3

Balance the following chemical equation:

$$\_\_AgNO_3(aq) + \_\_K_2CrO_4(aq) = \_\_Ag_2CrO_4(s) + \_\_KNO_3(aq)$$

What is taking you so long ?

3.3b Balancing – Example_3

Balance the following chemical equation:

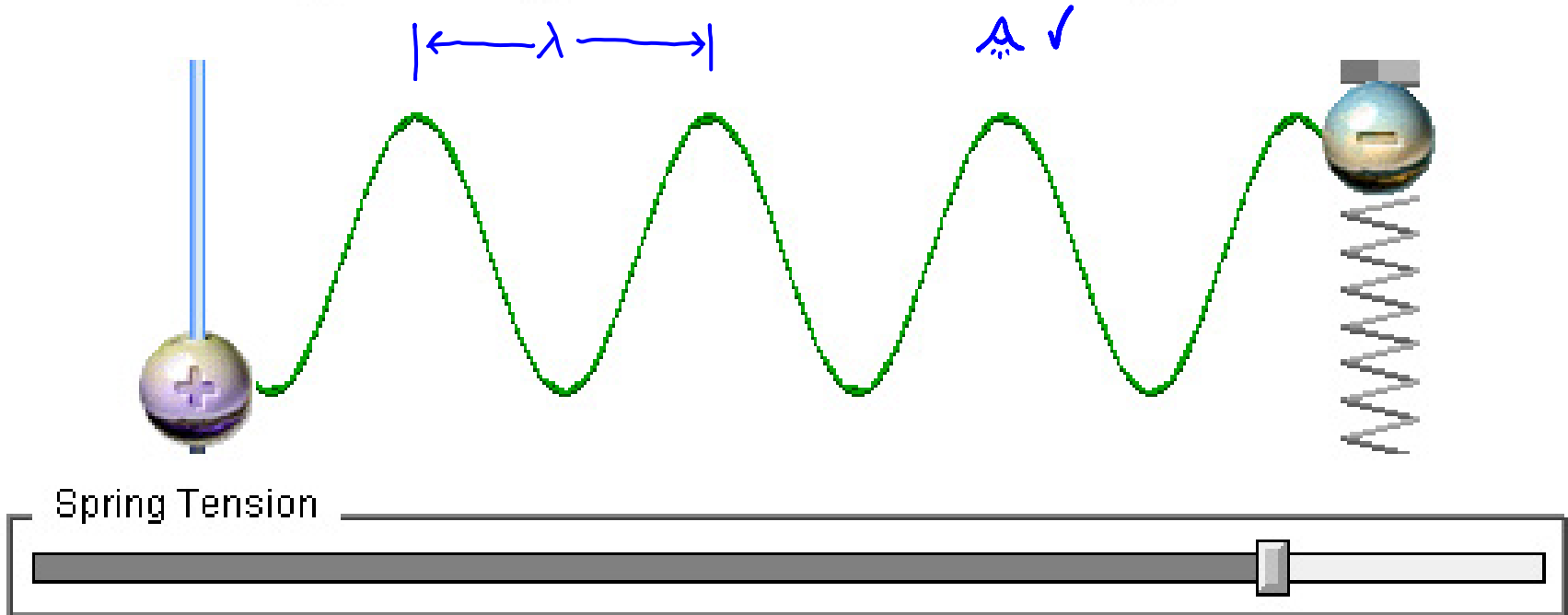$$\underline{2}\,AgNO_3(aq) + \underline{}\,K_2CrO_4(aq) \quad = \quad \underline{}\,Ag_2CrO_4(s) + \underline{2}\,KNO_3(aq)$$

Reactants	✓				
Ag	1	2	2		
NO_3	1	2	2		
K	2	2	2		
CrO_4	1	1	1		

Products	✓				
Ag	2	2	2		
NO_3	1	1	2		
K	1	1	2		
CrO_4	1	1	1		

$$2\,AgNO_3(aq) + K_2CrO_4(aq) = Ag_2CrO_4(s) + 2\,KNO_3(aq)$$
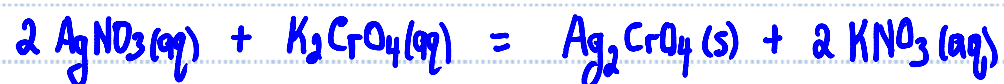
6.1   Electromagnetic Radiation
a) Wavelength and Frequency

Vibrating Charges and Electromagnetic Waves

$|\longleftarrow \lambda \longrightarrow|$ A √

Spring Tension

	SYMBOL	UNIT
Wavelength	λ	m
Frequency	v	s^{-1} OR Hz (Hertz)

6.1 Electromagnetic Radiation
b) The Electromagnetic Spectrum

Visible spectrum

Increasing Wavelength (λ) in nm →
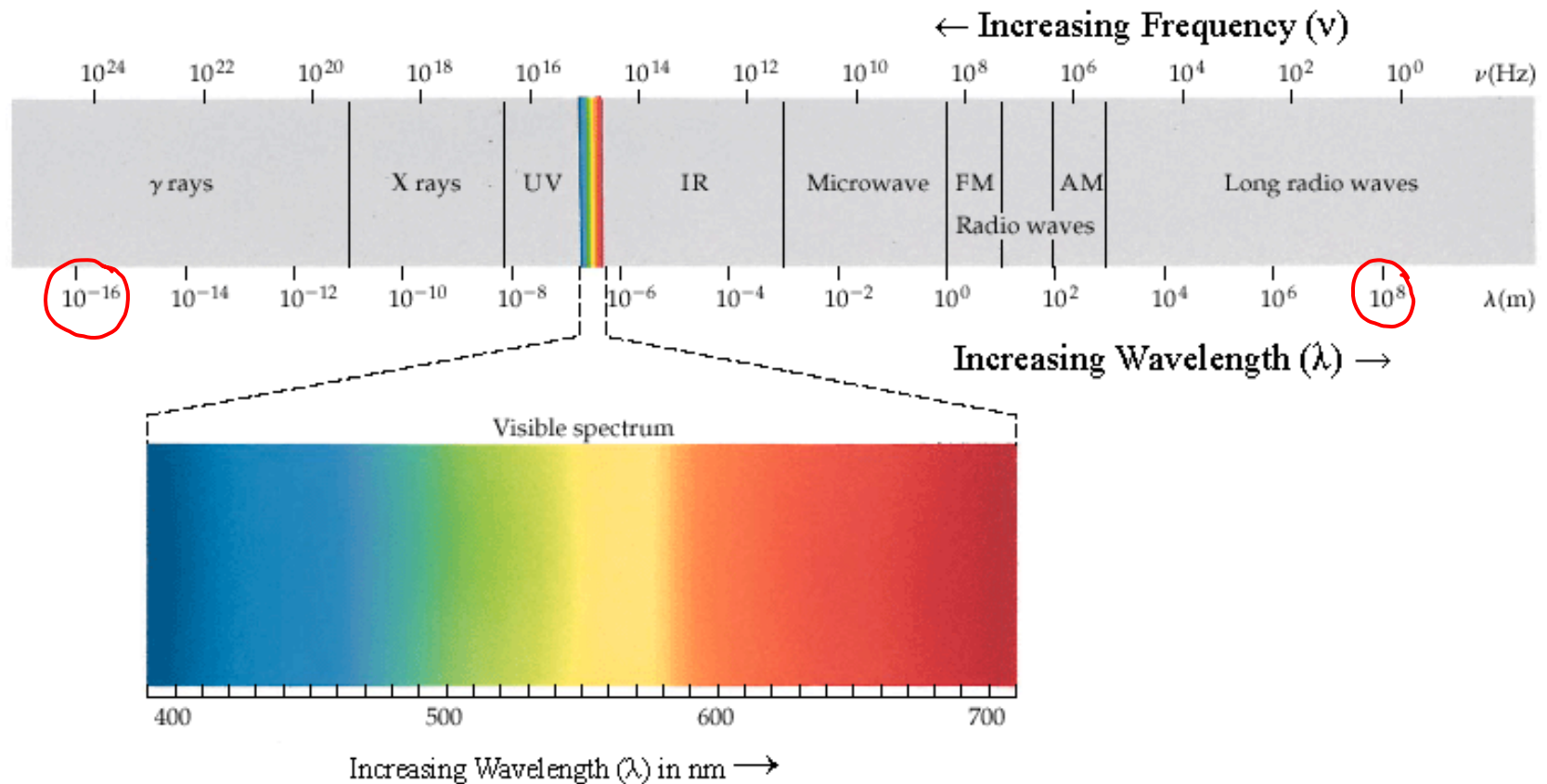
Let us focus on the visible region particulary the extremes ... Blue vs Red