

1A Exam 3 Spring 2017
(Chapter topics from 10, 5, 6)

Name _____

*****All calculations & work must be shown completely to receive credit. All units must be shown in calculations & answers. Relax & Good luck!**

1. 45.0 kg of propane, C_3H_8 , is combusted. What volume in Liters of carbon dioxide gas is produced at 789mmHg and $55^\circ C$. Be sure to write a balanced equation!

($PV = nRT$, $R = 0.08206 \text{ atm L /mol K}$, $1\text{atm} = 760 \text{ mmHg}$)

2. Calculate the wavelength of light emitted in nanometers when an electron transitions from $n = 5$ to $n = 3$.

3. Calculate the frequency of light with an energy of $7.65 \times 10^{-19} \text{J}$.

4. Calculate the enthalpy of the *solution process* in kJ/mol for the following & label as endo or exothermic: 8.0 grams of sodium chloride is dissolved in 65.0 grams of water to form a solution in which the temperature changes from 25.0°C to 29.0°C . The specific heat capacity of the solution is $4.18 \text{ J/g}^\circ\text{C}$.

5. Indicate the relationships between low energy, frequency, and wavelength. Then indicate the color of the visible light spectrum that is low energy. Be clear & to the point.

6. Electronic Configurations:

a. Give the noble configuration of the iron (II) ion.

b. Give the full configuration for chromium.

7. Orbital Diagrams:

a. Draw the full orbital diagram for oxygen & indicate if para- or diamagnetic. Circle the valence electrons.

8. Clearly explain what the following quantum numbers describe exactly as given AND indicate the number of electrons described by them.

a. $n = 4, l = 1, m_l = 0, -1$

b. $n = 3, l = 0, 2, m_s = \frac{1}{2}$