## CH 231 Quest Review 1

Measurement, Dimensional Analysis, Atoms and Elements in Chemistry

How many sigfigs? 0.0004 40. 4050 40.0040 0.004040

Calculate 4.39+9.6881 5.637\*3.400 (5.003-2)/1.46

Convert:

12.6 ml/inch2 to L/ft2

85m/s to km/day

**X** YAI What are the values of x and y?

Which pair of elements illustrates the law of multiple proportions?

CO and CaCO<sub>3</sub> H<sub>2</sub>SO<sub>4</sub> and H<sub>2</sub>s SO and SO<sub>2</sub> CO<sub>2</sub> and C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>

If 100 grams of water vapor were to condense such that there was no more water vapor, how many grams of liquid water should be found?

- 4) Given tungsten (W-184)
- a) Determine number of protons, neutrons and electrons
- b) Tungsten is dense, with a density of 19.3 g/cm $^3$ . What is the mass of a piece of tungsten whose volume is 14.0 km $^3$ ?

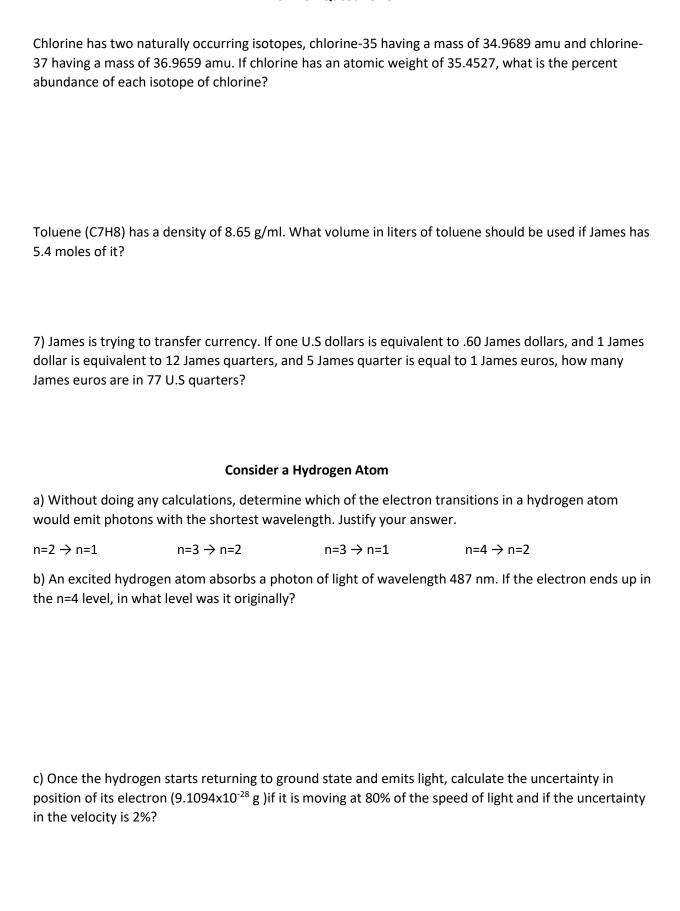
How many valence electrons does each of the following have:

Li Ca B O F I S Na Mg

Valence electrons in calcium travel about 2.212 km in 1.50 second. How many minutes would it take this valence electron to travel around the Earth? (24,901 miles) Note: 1 mile equals 1600 meters.

Jamesonnium (Jh) has 3 naturally occurring isotopes. If Jamesonnium has an average atomic weight of 87.11 amu, what is the mass of Jh-88?

Isotope	Mass amu	Percent abundance
Jh-85	84.87	11.54%
Jh-86	86.22	43.60%
Jh-88		



d)If the total energy of a mole of a photon emitted from this exothermic process is 120 kJ, what is the wavelength of the photons?

## Light, waves, energy, and the photoelectric effect

What is the energy of one photon of orange light? (650nm)

The frequency of a light wave is 4.5\*10<sup>-19</sup> Hz. What is its wavelength?

A starship delivery robot isn't watching where its going and runs into you. If it has a mass of 18000 grams, and is moving at 16 meters/minute, what is its kinetic energy?

Determine the longest wavelength of light that can remove an electron from a sample of potassium metal, if the binding energy for one electron in potassium is  $4.59 \times 10^{-18}$  J

A photon of light strikes a detector in a camera's light meter with an energy of 6.00x10 -17 J. What is the frequency and wavelength of this photon?

If a photon with a wavelength of 350 nm impacts a metal whose binding energy is  $4.00 \times 10$ , will the metal surface eject and electron? If so, what is the kinetic energy of the liberated electron?

If a photon with a wavelength of 350 nm impacts a metal whose frequency threshold is 6.037 x 1013 hertz, will the metal surface eject and electron? If so, what is the velocity of the liberated electron? (mass of electron is  $9.11*10^{-28}$  g)

Splat! Sean is struck by a snowball (mass of 75 grams) at 45 km/hr.

- a) What is the wavelength of this snowball in nanometers?
- b) What is the uncertainty of the position of this snowball with a velocity uncertainty of 5%?