

CHM 151

Recitation #1, 3 September 2008

1. Decide if the following substances are elements, compounds, or mixtures.

<input type="text"/>	hydrogen gas	<input type="text"/>	CH ₄	<input type="text"/>	silicon
<input type="text"/>	salt and pepper	<input type="text"/>	orange juice	<input type="text"/>	Cs
<input type="text"/>	water				

2. Complete the following table of metric prefixes.

Prefix	Symbol	Meaning
nano-		
milli-		
kilo-		
micro-		

3. What is the number of significant figures in each of the following measured quantities?

- a) 40.02 g/cm³ _____
- b) 0.0000003 cm _____
- c) 70 min _____
- d) 4.600 × 10¹⁹ pg _____

4. Carry out the following operations and express the answer with the appropriate number of significant figures.

- a) 95 + 5.1 = _____
- b) 558 × 3.225 = _____
- c) (15.5 - 11.1) × 5.25 = _____

5. Two students in CHM 151 lab are trying to determine the density of aluminum metal. They are each given an aluminum cylinder which they weigh, and then determine the volume by displacement of water. They each run three trials. The data is presented below. Which data is better, and why? The density of aluminum is 2.7 g/mL. [density = mass/volume]

Student #1		Student #2	
mass (g)	volume (mL)	mass (g)	volume (mL)
40.51	14.9	62.10	20.1
40.50	14.9	62.13	20.5
40.53	15.0	62.09	19.6

6. The level of water in a 200 mL volumetric cylinder is read and found to have the meniscus at 113.31 mL. What will be the reading of the level of the water in the cylinder after a 13.454 g chunk of metal (density = 4.54 g/mL) is placed in the graduated cylinder?
7. How long (in minutes) will it take to fly from Denver to New York, a distance of 1631 miles, at a speed of 815 km/hour? [1 mile = 1.609 km]
8. What was the major discovery/discoveries in each of the following experiments?
- a) J.J. Thomson's cathode ray tube experiment
 - b) R.A. Millikan's oil drop experiment
 - c) Rutherford's alpha particle scattering experiment
9. How many protons, neutrons, and electrons are contained in each of the following atoms or ions?
- a) ^{35}Cl
 - b) $^{27}\text{Al}^{3+}$
 - c) $^{79}\text{Se}^{2-}$
10. **True or False.** The mass of a neutron is several orders of magnitude greater than the mass of an electron.