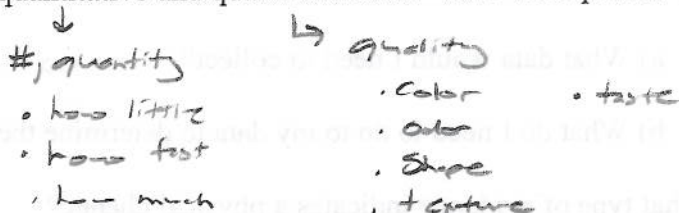


Chemistry Review: Chapters 1-3

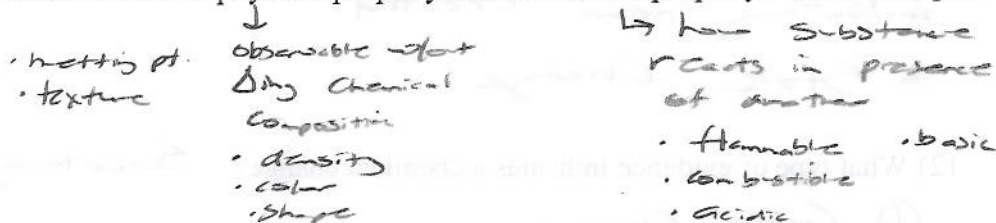
1) Name the SI Base Unit for each of the following:

- a) Time *second* c) Mass *Kg*
 b) Length *m* d) Temperature *Kelvin*

2) What is the difference between quantitative and qualitative data? Give examples of each.



3) What is the difference between a physical property and a chemical property? Give examples of each.



4) According to the scientific method, what must be done before a scientist can formulate a hypothesis?

Make observations

5) What is the purpose of calculating percent error? What is the formula?

- Find accuracy of your lab data, experimental results

$$\frac{| \text{Exp} - \text{Th} |}{\text{Th}} \times 100$$

6) How many cm³ are in each of the following?

- a) 20 ml *20cm³* b) 1 ml *1cm³* c) 1234 ml *1234cm³*

7) Write the following numbers in scientific notation, to 3 significant digits.

- a) 0.000123 b) 1236.5 c) 223.456 d) 0.012367
1.23 × 10⁻⁴ *1.24 × 10³* *2.23 × 10²* *1.24 × 10⁻²*

8) Write the following numbers in decimal representation.

- a) 1.23 × 10³ b) 5.0060 × 10⁻⁴ c) 6.7078 × 10⁵
1230 *.00050060* *670780*

9) I want to measure the volume of soda I have left in my bottle.

a) What piece of lab equipment should I use to do this? *grad. cylinder*

b) What units will my volume be measured in? *mL*

c) Should I drink the soda that I have left? *No*

10) I would like to calculate the density of a marble.

a) What data would I need to collect? *mass + volume*

b) What do I need to do to my data to determine the density? *mass ÷ vol.*

11) What type of evidence indicates a physical change?

* Nothing new created

* State change

12) What type of evidence indicates a chemical change? *Something new created!*

① Color Change

② Formation of precipitate (solid)

③ Light

④ Heat absorb/emitted

⑤ Conduct Elec.

⑥ Formation of Gas (Bubbles)

13) How can a mixture be separated?

physically

14) How can a compound be separated?

chemically

*Also review your note sheets, homework sheets, and lab safety!

Unit 1 Test Review – Chapter 1, 2, and 3

Test is half vocabulary (review your reading notes) and half numbers!

1) State the number of significant figures.

- a) 4.008 4 b) 37.000 5 c) 0.00100 3 d) 0.000520000 6

2) Solve. Put answers in scientific notation and use the correct number of significant figures.

a) $(3.00 \times 10^5)(8.73 \times 10^{-6})$

$$\boxed{2.62 \times 10^0}$$

b) $\frac{8.721 \times 10^{-6}}{4.872 \times 10^{-8}}$

$$\boxed{1.790 \times 10^2}$$

c) $\frac{(3.8 \times 10^4)(4.87 \times 10^{-9})(2.1 \times 10^2)}{(4.12 \times 10^{-10})(8.71 \times 10^8)}$

$$\boxed{1.1 \times 10^{-1}}$$

d) $\frac{(4.87 \times 10^{-8})(2.8 \times 10^{-3})}{(6.3 \times 10^4)(8.2 \times 10^8)(4.87 \times 10^5)}$

$$\boxed{5.4 \times 10^{-30}}$$

e) $87.423 + 103.23 + 8.1234$

$$\boxed{198.78 \rightarrow 1.9878 \times 10^2}$$

3) Convert 0.75 kilograms to milligrams.

$$\frac{1000 \text{ mg}}{1 \text{ g}} \mid \frac{1000 \text{ g}}{1 \text{ kg}} \mid 0.75 \text{ kg} = 750000 \quad \boxed{7.5 \times 10^5 \text{ mg}}$$

4) A sign in a town gives the speed limit at 50 km/hr. What is this speed in centimeters per second?

$$\frac{100 \text{ cm}}{1 \text{ m}} \mid \frac{1000 \text{ m}}{1 \text{ km}} \mid \frac{50 \text{ km}}{1 \text{ hr}} \mid \frac{1 \text{ hr}}{60 \text{ min}} \mid \frac{1 \text{ min}}{60 \text{ sec}} = \boxed{1 \times 10^3 \frac{\text{cm}}{\text{sec}}}$$

5) A chemistry instructor provides each student with 8 test tubes at the beginning of the school year. If there are 28 students per class, how many test tubes are required for three chemistry classes?

$$\frac{8 \text{ test tubes}}{1 \text{ student}} \mid \frac{28 \text{ students}}{1 \text{ class}} \mid 3 \text{ classes} = \boxed{7 \times 10^2 \text{ test tubes}}$$

$$\frac{M}{D \cdot V}$$

6) Calcium chloride is used as a deicer on roads in the winter. It has a density of 2.50 g/cm^3 . What is the volume of 7.91 kg of this substance?

$$V = \frac{M}{D} = \frac{7910 \text{ g}}{2.50 \text{ g/cm}^3} = 3.16 \times 10^3 \text{ cm}^3$$

$7.91 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} = 7910 \text{ g}$

7) An experiment performed to determine the density of lead yields a value of 10.95 g/cm^3 . The literature value for the density of lead is 11.342 g/cm^3 . Find the percent error.

$$\frac{|10.95 - 11.342|}{11.342} \times 100 = 3.45\%$$

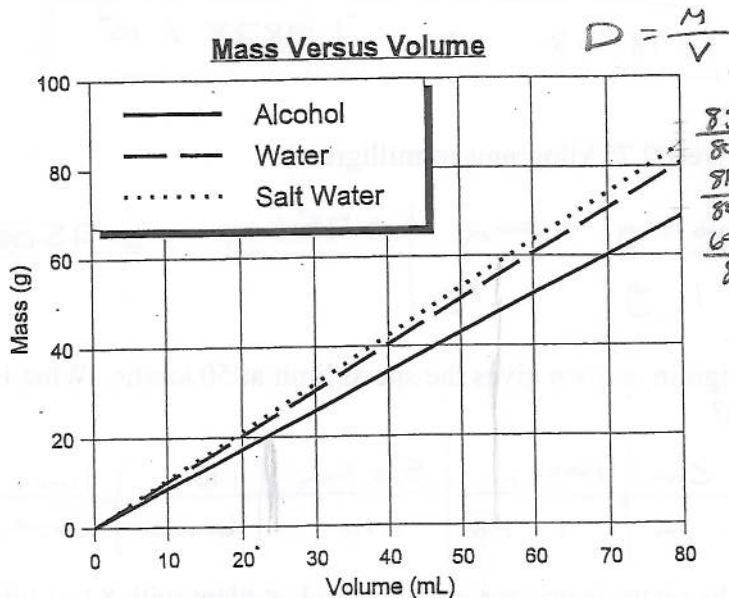
8) A brick has dimensions 2.4 cm by 5.4 cm by 8.2 cm and its mass of 253 g . What is the density of the brick?

$$V = 2.4 \cdot 5.4 \cdot 8.2 = 110 \text{ cm}^3$$

$$D = \frac{M}{V} = \frac{253 \text{ g}}{110 \text{ cm}^3} = 2.3 \text{ g/cm}^3$$

9) Consider the following graph:

- By looking at the graph, which sample was the least dense?
- Calculate the density of each sample.
- What mass of salt water had a volume of 55 mL ?
- What volume of alcohol had a mass of 20 g ?
- If a solid with a density of 0.92 g/mL was placed in a beaker containing all three of these liquids, where would it be situated?



a) Alcohol

b) Salt H₂O 1.06 g/mL c) 59 g

d) 23 mL

e)

Water 1.01 g/mL
Alcohol 0.86 g/mL

