

Exam I – Chapters 1-5

$$1 \text{ inch} = 2.54 \text{ cm} \quad 1 \text{ gal} = 3.785 \text{ L}$$

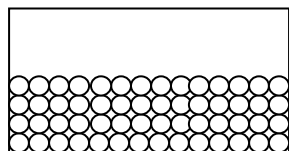
$$1 \text{ mile} = 1.61 \text{ km} \quad 1 \text{ lb} = 454 \text{ g}$$

$$T_{\text{F}} - 32 = T_{\text{C}} \times 1.80$$

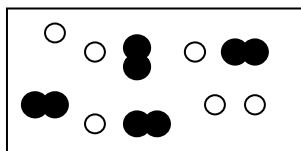
1. (10 pts) Name the following elements (use proper spelling!):

- a. F **fluorine**
- b. Ne **neon**
- c. Mg **magnesium**
- d. K **potassium**
- e. Si **silicon**

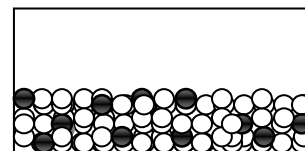
2. (6 pts) Determine whether the following are solid (s), liquid (l), gas (g) **AND** whether they are pure or a mixture:



s l g **AND** pure / mixture



s l g **AND** pure / mixture



s l g **AND** pure / mixture

3. (16 pts) Determine whether the following statements are true or false (circle one):

- a. When converting from grams (g) to centigrams (cg), you multiply by 1000. **T / F**
- b. When converting from deciliters (dL) to liters (L), you divide by 10. **T / F**
- c. The process of a gas turning into a liquid is termed vaporization. **T / F**
- d. The element silicon has the noble gas electron configuration $[\text{Ar}]3s^23p^2$ **T / F**
- e. The process of a liquid turning into a solid is termed freezing. **T / F**
- f. Atoms are tiny, indivisible, and indestructible. **T / F**
- g. Once a scientific theory is developed, it can never be disproved. **T / F**
- h. Heat transfers from a substance at a higher temperature to a substance at a lower temperature. **T / F**

4. (10 pts) Write the symbol for the following elements:

- a. aluminum **Al**
- b. sodium **Na**
- c. oxygen **O**
- d. boron **B**
- e. argon **Ar**

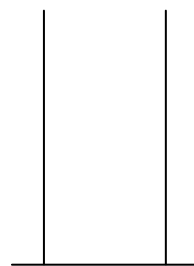
5. (10 pts) Write the correct symbol for the element that fits the following description:

- a. The noble gas in period 6. **Rn**
- b. The alkaline earth metal in period 4. **Ca**
- c. The semi-metal in group VA and period 5. **Sb**
- d. The halogen in period 3. **Cl**
- e. The alkali metal in period 7. **Fr**

6. (10 pts) Place the following liquids and solids in proper order in the graduated cylinder according to density:

- a. liquid water, $d = 1.00 \text{ g/mL}$
- b. solid wood, $d = 0.850 \text{ g/cm}^3$
- c. liquid mercury, $d = 13.534 \text{ g/mL}$
- d. solid aluminum, $d = 2.70 \text{ g/cm}^3$
- e. liquid isopropanol (rubbing alcohol), $d = 0.786 \text{ g/mL}$

top E B A D C bottom



7. (4 pts) (5 pts) Convert 223.7 mg into pounds.

$$223.7 \text{ mg} \left(\frac{1 \text{ g}}{1000 \text{ mg}} \right) \left(\frac{1 \text{ lb}}{454 \text{ g}} \right) = 4.92 \times 10^{-4} \text{ lb}$$

8. (4 pts) Convert 104°C into degrees Fahrenheit.

$$(1.80 \times 104) + 32 = 219^\circ\text{F}$$

9. (5 pts) If an automobile is traveling 55 miles per hour on a highway with a maximum speed limit of 35 meters per second, is the automobile speeding? *All work must be shown to receive full credit.*

$$\frac{55 \text{ miles}}{1 \text{ hour}} \left(\frac{1.61 \text{ km}}{1 \text{ mile}} \right) \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{1 \text{ hr}}{3600 \text{ s}} \right) = 25 \text{ meters per second} \quad \text{Therefore not speeding!}$$

10. (5 pts) Calculate the density of an unknown solution that has a mass of 12.6798 g and a volume of 8.95 mL.

$$\frac{12.6798 \text{ g}}{8.95 \text{ mL}} = 1.42 \text{ g/mL}$$

11. (pts) If a student has a rectangular block that has a density of 3.50 g/cm^3 and a volume of 0.500 L, what is the mass of the rectangular block?

$$0.500 \text{ L} \left(\frac{1000 \text{ mL}}{1 \text{ L}} \right) \left(\frac{1 \text{ cm}^3}{1 \text{ mL}} \right) (3.50 \text{ g/cm}^3) = 1750 \text{ g}$$

12. (6 pts) Write the full electron configuration for the following elements:

a. potassium: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

b. nitrogen: $1s^2 2s^2 2p^3$

13. (9 pts) Complete the following table:

Isotope	Mass Number	Atomic Number	# of Protons	# of Neutrons	# of Electrons
^{82}Br	82	35	35	47	35
S	34	16	16	18	16

Extra Credit: (3 pts)

Which has the larger volume, 0.420 yd^3 of water or 129 L of water? *All work must be shown to receive full credit.*