

CHM151 Quiz #2a 25 Pts Fall 2004 Name: Key

$M = 10^6$ ,  $k = 10^3$ ,  $c = 10^{-2}$ ,  $m = 10^{-3}$ ,  $2.54 \text{ cm} = 1 \text{ in}$ ,  $12 \text{ in} = 1 \text{ ft}$ ,  $5280 \text{ ft} = 1 \text{ mile}$

Show All Work to Receive Credit.

1. (8 Pts) Complete the following table:

Element or ion name	Element or ion symbol	Number of Protons	Number of Electrons	Number of Neutrons
phosphorous	P-31	15	15	16
Iron-56	$^{56}_{26}\text{Fe}$	26	26	30
A sodium-23 cation	$^{23}_{11}\text{Na}^+$	11	10	12
An iodine-127 anion	$^{127}_{53}\text{I}^-$	53	54	74

2. (6 Pts) Determine which ELEMENT OR ION in each pair has a larger volume and EXPLAIN YOUR REASONING.

a. K or  $\text{K}^+$ ? Larger K Reason:  $\text{K}^+$  has one less  $e^-$

b. Mg or  $\text{Cl}^-$ ? Larger Mg Reason: same number of shells but Cl has more protons to pull on each  $e^-$ .

c. S or Te? Larger Te Reason: Te has 2 more shells.

3. (5 Pts) What volume of bromine (density = 2.928 g/mL at 20°C) is needed to provide 27.5 grams of bromine?

$$\frac{27.5 \text{ g}}{2.928 \text{ g/mL}} = 9.392 \text{ mL}$$

4. (3 Pts) Describe what would happen on the electronic level in a chemical reaction between a metal and a non-metal. The metal will lose  $e^-$  (s) to the non-metal.

5. (2 Pts) Give the name and symbol for:

A metal \_\_\_\_\_ A non metal \_\_\_\_\_

6. (1 Pt) How many inches are there in 48 centi milli inches? \_\_\_\_\_

$$\frac{48 \text{ cmi}}{10^{-2}} \times \frac{1}{10^{-3}} = 48 \times 10^{-5} \text{ in}$$

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Show All Work to Receive Credit.

1. (8 Pts) Complete the following table:

Element or ion name	Element or ion symbol	Number of Protons	Number of Electrons	Number of Neutrons
phosphorous	P-31	15	15	16
Iron-56	$^{56}_{26}\text{Fe}$	26	26	30
A potassium-40 cation	$^{40}_{19}\text{K}^+$	19	18	21
An iodine-129 anion	$^{129}_{53}\text{I}^-$	53	54	$129 - 53 = 76$

2. (6 Pts) Determine which ELEMENT OR ION in each pair has a larger volume and EXPLAIN YOUR REASONING.

a. Rb or  $\text{Rb}^+$ ? Larger Rb Reason:  $\text{Rb}^+$  has one less  $e^-$ .

b. Al or Cl? Larger Al Reason: Same number of shells but Cl has more protons to "pull in"  $e^-$ .

c. Po or Te? Larger Po Reason: Po has one more "layer" of electrons. (periodic table)

3. (5 Pts) What volume of bromine (density = 2.928 g/mL at 20°C) is needed to provide 58.5 grams of bromine?

$$\frac{58.5 \text{ g}}{2.928 \text{ g/mL}} = 19.98 \text{ mL}$$

4. (3 Pts) Describe what would happen on the electronic level in a chemical reaction between a metal and a non-metal.

The metal would lose  $e^-$ (s) to the non-metal.

5. (2 Pts) Give the name and symbol for:

A non-metal \_\_\_\_\_ A metal \_\_\_\_\_

6. (1 Pt) How many feet are there in 48 centi milli inches?  $\frac{48 \times 10^{-2} \times 10^{-3} \text{ in}}{12 \text{ in}} = 4 \times 10^{-5} \text{ ft}$