

last name KEYScored grade (instructor use only!) 75

1. [4 points] What is the mass, in grams, of 2.30 moles of aluminum oxide? Circle the correct answer.

43.0   44.3   59.0   70.0   75.0   86.0   96.9   98.9   102   109  
 113   129   136   172   161   198   223   235   260.   297

(4)

2. [6 pts] Fill in the table below:

Symbol	# protons	# electrons	# neutrons	mass number	charge
<u>S</u>	<u>16</u>	18	17	<u>33</u>	-2
<u>K</u>	19	18	<u>21</u>	40	<u>+1</u>

3. [10 pts] Give the correct name for each of the following. Spelling counts.

Mercury (I) chloride    $\text{Hg}_2\text{Cl}_2$     $\text{Hg}_2^{2+}, \text{Cl}^-$

Sodium phosphate    $\text{Na}_3\text{PO}_4$

disilicon tetrachloride    $\text{Si}_2\text{Cl}_4$

Sulfur trioxide    $\text{SO}_3$

manganese(II) oxalate    $\text{MnC}_2\text{O}_4$

4. [10 pts] Give the correct chemical formula for each of the following.

$\text{H}_2\text{O}_2$    hydrogen peroxide    $\text{SF}_6$    sulfur hexafluoride

$\text{AgNO}_3$    silver nitrate    $\text{CuSO}_4$    copper(II) sulfate

$\text{CH}_4$    methane

5. [3 points] Galena, a mineral of lead, is a compound of the metal with sulfur. Analysis shows that a 2.34-g sample of galena contains 2.03 g of lead. Calculate the mass percent of sulfur in galena (rounded to the appropriate precision). Clearly show your work to earn credit.

$$\frac{2.03 \text{ g lead}}{2.34 \text{ g galena}} = 0.8675 \text{ or } 86.8\% \text{ lead}$$

$$100 - 86.8\% = \boxed{13.2\% \text{ sulfur}}$$

last name \_\_\_\_\_

6. [18 pts] Clearly indicate whether each statement is TRUE or FALSE. If we can't tell which you mean, it's wrong.

True The value 109.020 has six significant figures.

true The compound  $\text{Fe}(\text{OH})_2$  contains both ionic and covalent bonds.

true  $\text{Fe}(\text{OH})_2$  is an ionic compound.

true All transition elements are metals.

false The mass number of an atom of fluorine-19 is 19.00.  $\rightarrow 19$  (must be whole number)  $\leftarrow$  atomic weight, average mass

false One mole of neon weighs 20.18 amu. no - 20.18g

true There are variable-charge main-group metals.

true  $1 \text{ m}^3 = 10^9 \text{ mm}^3$ .

false  $\text{N}_2\text{O}_3$  is composed of  $\text{N}^{3-}$  and  $\text{O}^{2-}$  ions. it's a covalent compound

7. [14 pts] Supply the **symbol** of the correct element for each of the following descriptions. In some cases there could be more than one acceptable answer; provide **one**.

At or Rn A nonmetal in Period 6.

Sn, Pb or Uug A Group 14 metal.

$\text{H}_2$  An element that appears as diatomic molecules. or  $\text{N}_2$   $\text{O}_2$   $\text{F}_2$   $\text{Cl}_2$   $\text{Br}_2$   $\text{I}_2$

Ag or Zn A transition metal that forms a constant-charge cation.

He An element that does not form covalent compounds. any metal, any noble gas accepted

C, S, Ge An element that forms **only** covalent compounds.

H An element that forms both a +1 monatomic ion and a -1 monatomic ion.

8. [10 pts]\*\*In the space below, write the balanced equation for the following reaction:

Lead(II) nitrate decomposes to produce lead(II) oxide, nitrogen monoxide, and oxygen gas.

