Practice Midterm

Name_____

Please answer questions 1-14 on an 882-E scantron. 2 points each

1. What is the molar mass of $Mg(ClO_4)_2$?
   A. 223.21g
   B. 1.00g
   C. 301.01g
   D. 187.76g

2. What is the percent by mass of carbon in carbon dioxide?
   A. 3.66%
   B. 366%
   C. 27.28%
   D. 42.9%

3. How many moles are present in 1.51×10^{23} molecules of HCl?
   A. 9.12
   B. 0.251
   C. 3.99
   D. 146

4. Which of the following contains the greatest number of atoms?
   A. 1.0g of lithium
   B. 1.0g of sodium
   C. 1.0g of aluminum
   D. 1.0g of silver

5. How many molecules are present in 4.21 moles of HBr?
   A. 1.53×10^{25}
   B. 2.53×10^{25}
   C. 4.21×10^{23}
   D. 2.53×10^{24}

6. When the equation $Cr_2S_3 + HCl \rightarrow CrCl_3 + H_2S$ is balanced, a term in the balanced equation is
   A. 3HCl
   B. $CrCl_3$
   C. $3H_2S$
   D. $2Cr_2S_3$

7. When the equation $H_2 + V_2O_5 \rightarrow V + H_2O$ is balanced, a term in the balanced equation is

A. $2V_2O_5$
B. $3H_2O$
C. 2V
D. 10 H_2

8. What is the formula of calcium chloride?

A. CaCl
B. $CaCl_2$
C. Ca_2Cl
D. Ca_2Cl_2

9) What is the specific heat (J/g·°C) of a metal object whose temperature increases by 3.0°C when 17.5 g of metal was heated with 38.5 J?
A) 4.18
B) 0.15
C) 0.73
D) 1.4
E) none of the above

10. Which isotope has the same number of protons, neutrons, and electrons?

A. Cl-35
B. Cl-37
C. P-31
D. S-32
E. None of the above

11) Suppose it took 108 joules of energy to raise a bar of gold from 25.0°C to 29.7°C. Given that the specific heat capacity of gold is 0.128 J/g·°C, what is the mass (in grams) of the bar of gold?
A) 6.5×10^1 g
B) 1.8×10^2 g
C) 1.28×10^2 g
D) 1.08×10^2 g
E) none of the above

12) How much heat (kJ) is needed to raise the temperature of 100.0 grams of water from 25.0°C to 50.0°C?
A) 10450
B) 0.598
C) 1.05
D) 10.5
E) none of the above

13) The distance between the two hydrogen atoms in a molecule of water is 0.000000000172 m. Express this distance in scientific notation.
A) 1.72×10^{-9} m

B) 1.72×10^{-10} m
C) 0.172×10^{-10} m
D) 17.2×10^{9} m
E) 1.72×10^{10} m

14. How many atoms of oxygen are indicated in the formula $Fe(NO_3)_2$?
    A. 2
    B. 3
    C. 5
    D. 6

For each of the following questions, determine the compound name. Reference complex ions to help you and use roman numerals where appropriate (2 points each)

15) $Cd_3(PO_4)_2$_____

16) CCl_4 _____

17) FeF_2 _____

For each of the following questions, write the appropriate formula for it. (2 points each)

18) Calcium nitride _____

19) Nitric acid _____

20) Chromium (VI) oxide _____

21. A sample is analyzed to be 39.9% Carbon, 6.7% Hydrogen and 53.4% Oxygen. The molar mass of the compound (Real formula) is 180.2 grams/mole. Find: (1) the empirical formula (5 points), (2) the molecular formula (5 points) . (10 points total) Show work!!!

Topics to study

Scientific Method
Scientific Notation
Dimensional analysis
Density
Compounds
Naming
Physical vs. Chemical Changes
Heat and Energy $Q=mC\Delta T$
Isotopes
Atomic mass
Mole, Molar mass
Empirical formula
Simple balancing