Chemistry 20 - Unit 0 - Review Package

Name:_____

1. Complete the table below

	Protons	Electrons	Neutrons
$Al^{3+}_{(aq)}$	13	10	14
$Ca_{(s)}$	20	20	20
$Br^{-}_{(aq)}$	35	36	45

2. For the compounds below, show the molecular formula; determine whether the bond is **ionic** or **molecular** and write the chemical formula for each.

Magnesium chloride (ionic) $MgCl_{2(s)}$	Carbon dioxide (molecular) $CO_{2(g)}$
Methane (Molecular) $CH_{4(g)}$	Aluminum sulfide (ionic) $AlS_{3(s)}$

3. For the following reactions, determine the reaction type and balance the reaction including states for all compounds.

Reaction type	Balanced Equation
decomposition	Ammonia breaks down into its elements $2NH_3 \rightarrow N_2 + 3H_2$
Single replacement	Hydrogen reacts with strontium bromide $H_2 + SrBr_2 \rightarrow 2HBr + Sr$

combustion	Ethanol burns $CH_3CH_2OH_{(l)} + 7O_{2(g)} \rightarrow 4CO_{2(g)} + 6H_2O_{(g)}$
Formation	Solid magnesium oxide reacts with carbon dioxide to form magnesium carbonate $MgO_{(s)} + CO_{2(g)} \rightarrow MgCO_{3(s)}$
double replacement	Beryllium nitride reacts with rubidium sulfide $Be_3N_2 + 3Rb_2S \rightarrow 2Rb_3N + 3BeS$
double replacement (neutralization)	Hydrogen sulfite reacts with lithium hydroxide $H_2SO_4 + 2LiOH \rightarrow Li_2SO_4 + 2HOH$ (acid) (base) (salt) (ionic) (H_2O)

4. Calculate the number of grams for the following

a. 0.0027392 mols of silver nitrate

$M_{AgNO_3} = M_{Ag} + M_N + 3M_{Oxy}$
$= 107.87 + 14.01 + 3\times16.00 = 169.88\ g/mol$

$m = Mn$
$= 169.88 \times 0.0027392$
$= 0.46534\ g$

b. 12.472×10^{19} molecules of barium sulfide

$n = \frac{12.472\times10^{19}}{6.022\times10^{23}} = 0.00020711\ mol$

$M_{BaS} = 137.33 + 32.07$
$= 169.40\ g/mol$

$m = Mn$
$= 169.40 \times 0.00020711$
$= 0.035084\ g$

5. Calculate the number of molecules for the following

a. 4.38 grams of tetraphosphorus decaoxide

$M_{P_4O_{10}} = 4\times30.97 + 10\times16$
$= 283.88\ g/mol$

$n = \frac{m}{M} = \frac{4.38}{283.88}$
$= 0.0154\ mol$

molecules $= 0.0154 \times 6.022\times10^{23}$
$= 9.29\times10^{21}$ molecules (particles)

b. 0.00274 kg of hydrogen borate.

$M_{H_3BO_3} = 3\times1.01 + 10.81 + 3\times16$
$= 61.84\ g/mol$

$n = \frac{m}{M} = \frac{2.74\ g}{61.84\ g/mol}$
$= 0.0443\ mol$

molecules $= 0.0443\times6.022\times10^{23}$
$= 2.67\times10^{22}$ molecules