Mole Conversions #3

Name KEY
Period _____

Write the formula for each substance on the line provided.
Perform the designated calculation. Show work. Include units.

Convert each of the following gram amounts into moles.

H_2 1. 20 g hydrogen $\times \frac{1\text{ mol}}{2.02\text{ g}} = 9.901 = 10\text{ mol } H_2$

CO_2 2. 48.67 g carbon dioxide $\times \frac{1\text{ mol}}{44.0\text{ g}} = 1.11\text{ mol } CO_2$
$(12.0)+2(16.0)=44$

$BaSO_4$ 3. 3.4 g barium sulfate $\times \frac{1\text{ mol}}{233.4\text{ g}} = 0.015\text{ mol } BaSO_4$
$(137.3)+(32.1)+4(16.0)=233.4$

HCl 4. 52.97 g hydrochloric acid $\times \frac{1\text{ mol}}{36.51\text{ g}} = 1.45\text{ mol } HCl$
$1.01+35.5=36.51$

Convert each of the following mole amounts into grams.

$NaCl$ 5. 0.64 moles sodium chloride $\times \frac{58.5\text{ g}}{1\text{ mol}} = 37\text{ g } NaCl$
$23.0+35.5=58.5$

$CaCO_3$ 6. 1.5 moles calcium carbonate $\times \frac{100.1\text{ g}}{1\text{ mol}} = 150\text{ g } CaCO_3$
$40.1+12.0+3(16.0)=100.1$

Al 7. 2.03 moles aluminum $\times \frac{27.0\text{ g}}{1\text{ mol}} = 54.8\text{ g } Al$

$HC_2H_3O_2$ 8. 0.09426 moles acetic acid $\times \frac{60.04\text{ g}}{1\text{ mol}} = 5.66\text{ g } HC_2H_3O_2$
acetate $=C_2H_3O_2$
$4(1.01)+2(12.0)+2(16.0)=60.04$

Calculate the number of particles (atoms or molecules, whichever term applies) in each.

H_2O 9. 2.58 moles of water $\times \frac{6.02\times10^{23}\text{ molecules}}{1\text{ mol}} = 1.55\times10^{24}\text{ molecules } H_2O$

CH_4 10. 0.78 moles of methane $\times \frac{6.02\times10^{23}\text{ molecules}}{1\text{ mole}} = 4.7\times10^{23}\text{ molecules } CH_4$

Ag 11. 47.2 g silver $\times \frac{1\text{ mol}}{107.9\text{ g}} \times \frac{6.02\times10^{23}\text{ atoms}}{1\text{ mol}} = 2.63\times10^{23}\text{ atoms } Ag$

$Mg(NO_3)_2$ 12. 158.3 g magnesium nitrate $\times \frac{1\text{ mol}}{148.3\text{ g}} \times \frac{6.02\times10^{23}\text{ molecules}}{1\text{ mol}} = 6.43\times10^{23}\text{ molecules } Mg(NO_3)_2$
$24.3+2(14.0)+6(16.0)=148.3$