Conceptual Chemistry

Do The first 12 questions show all work

Due May 18

GROUP A

1. What is the formula weight of potassium chlorate, $KClO_3$? *B3a*
2. Determine the formula weight of acetic acid, $HC_2H_3O_2$. *B3a*
3. Sucrose (cane sugar) has the formula $C_{12}H_{22}O_{11}$. Determine its formula weight. *B3a*
4. Determine the formula weight of glycerol, $C_3H_8O_3$. *B3a*
5. Potassium dichromate has the formula $K_2Cr_2O_7$. Determine its formula weight.
6. Crystalline magnesium sulfate (Epsom salts) has the formula $MgSO_4 \cdot 7H_2O$. What is its formula weight? *B3a*
7. Determine the formula weight of each of the following compounds: (*a*) K_2CO_3; (*b*) N_2H_4; (*c*) HgO; (*d*) $CuSO_4 \cdot 5H_2O$; (*e*) H_2SO_4; (*f*) $MgBr_2$; (*g*) Al_2S_3; (*h*) $Ca(NO_3)_2$; (*i*) $Fe_2(Cr_2O_7)_3$; (*j*) $KMnO_4$. *B3a*
8. Baking powders contain sodium hydrogen carbonate, $NaHCO_3$. Calculate its percentage composition. *B3b*
9. What is the percentage composition of a soap having the formula $C_{17}H_{35}COONa$? *B3b*
10. Vinegar contains acetic acid, $HC_2H_3O_2$. Find its percentage composition. *B3b*
11. What is the percentage composition of each of these compounds: (*a*) SO_2; (*b*) $Ca(OH)_2$; (*c*) $Ca(H_2PO_4)_2 \cdot H_2O$; (*d*) $MgSO_4 \cdot 7H_2O$?
12. Which of these compounds contains the highest percentage of nitrogen: (*a*) $Ca(NO_3)_2$; (*b*) $AgNO_3$; (*c*) $(NH_4)_2SO_4$? *B3b*
13. A strip of pure copper, mass 7.536 g, is heated with oxygen to form a compound of copper and oxygen, mass 9.433 g. What is the percentage composition of the compound? *B3b*
14. You are given 25.0 g of (*a*) CaO; (*b*) $Na_2CO_3 \cdot 10H_2O$; (*c*) $BaCl_2 \cdot 2H_2O$; (*d*) $(NH_4)_2SO_4$; (*e*) $Fe(NO_3)_3 \cdot 6H_2O$; (*f*) $Al_2(SO_4)_3 \cdot 18H_2O$; (*g*) K_2CrO_4. How many moles of each compound do you have? *B3c*
15. Calculate the mass of (*a*) 1.00 mole of chlorine atoms; (*b*) 5.00 moles of nitrogen atoms; (*c*) 3.00 moles of bromine molecules; (*d*) 6.00 moles of hydrogen chloride; (*e*) 10.0 moles of magnesium sulfate; (*f*) 2.50 moles of potassium iodide; (*g*) 0.500 mole of silver nitrate; (*h*) 0.100 mole of sodium chloride. *B3c*
16. How many moles of iron can be recovered from 2.500 metric tons (10^3 kg/metric ton) of Fe_3O_4? *B3c*