29

% By masses

1. Calculate the percent composition of each element in sucrose.

6

$\%C = \frac{12 \times 12.01\text{g C}}{342\text{g } C_{12}H_{22}O_{11}} \times 100 = 42.1\%\text{ C}$ $\%O = \frac{11 \times 16.00\text{g O}}{342\text{g } C_{12}H_{22}O_{11}} \times 100 = 51.5\%\text{ O}$

$\%H = \frac{22 \times 1.008\text{g H}}{342\text{g } C_{12}H_{22}O_{11}} \times 100 = 6.48\%\text{ H}$

2. Calculate the percent of each element in potassium dichromate.

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$\%K = \frac{2 \times 39.10\text{g K}}{294.2\text{g } K_2Cr_2O_7} \times 100 = 26.58\%\text{ K}$ $\%O = \frac{7 \times 16.00\text{g O}}{294.2\text{g } K_2Cr_2O_7} \times 100 = 38.07\%\text{ O}$

$\%Cr = \frac{2 \times 52.00\text{g Cr}}{294.2\text{g } K_2Cr_2O_7} \times 100 = 35.35\%\text{ Cr}$

3. Calculate the percent sulfate in aluminum sulfate (342.2) for 4-5 different ways

3

$\%\ SO_4^{2-} = \frac{3 \times 96.07\text{g } SO_4^{2-}}{342.2\text{g } Al_2(SO_4)_3} \times 100 = 84.22\%\ SO_4^{2-}$

4. Which compound has a higher percent by mass of chlorine: barium chloride(208.2) or rubibium chloride(120.9)

6

$BaCl_2$

$\%\text{ Cl} = \frac{2 \times 35.45\text{g Cl}}{208.2\text{g } BaCl_2} \times 100 = 34.05\%\text{ Cl}$

RbCl

$\%C = \frac{35.45\text{g Cl}}{120.9\text{g RbCl}} \times 100 = 29.32\%\text{ Cl}$

5. How many grams of sodium can be recovered from a 10.0 g sample of sodium chloride(58.44)?

4

$10.0\text{g NaCl} \times \frac{22.99\text{g Na}}{58.44\text{g NaCl}} = 3.93\text{g Na}$

6. Fungal laccase, a blue protein found in wood-rotting fungi, is 0.390 % copper by mass. If a fungal laccase molecule contains 4 copper atoms, what is the molar mass of fungal laccase?

4

$.390\%\text{ Cu} = \frac{4 \times 63.55\text{g Cu}}{x} \times 100$ $x = 65{,}200\text{ g/mol}$

~~25,420~~