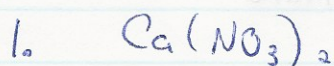


Self-Test on Tutorial 5-1 Answers

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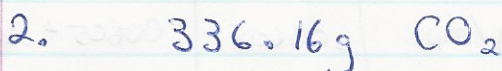
$$\text{Ca mass} = 40\text{g}, \quad \text{N mass} = 14 \times 2 = 28\text{g}$$

$$\text{O mass} = 16 \times 6 = 96\text{g} \quad \text{Total} = 164\text{g}$$

$$\% \text{ Ca} = \frac{40\text{g}}{164\text{g}} = 0.2439 \Rightarrow 24.4\%$$

$$\% \text{ N} = \frac{28\text{g}}{164\text{g}} = 0.1707 \Rightarrow 17.1\%$$

$$\% \text{ O} = \frac{96\text{g}}{164\text{g}} = 0.5853 \Rightarrow 58.5\%$$



$$\% \text{ Carbon is } \frac{12\text{g}}{44\text{g}} =$$

$$\text{CO}_2 \text{ molar mass} = 44\text{g/mol}$$

↓

$$\text{molar mass is } 12\text{g/mol}$$

$$27.27\%$$

$$\therefore 27.27\% \text{ of } 336.16\text{g}$$

$$= 91.67\text{g Carbon}$$



$$\text{Oxygen species} = 16\text{g} \times 6 = 96\text{g}$$

$$\text{Total molar mass} = 148\text{g}$$

$$\% \text{ O} = \frac{96\text{g}}{148\text{g}} = 64.86\%$$

$$64.86\% \text{ of } 860 =$$

$$557.8\text{g}$$

4. 0.8162 g potassium persulfate

a) if 0.2361 g is K and 0.1936 g is S, then:

$$0.8162 - (0.2361 + 0.1936) = 0.3865 \text{ g is oxygen}$$

b) Empirical formula

(element)	(mass)	(Atomic mass)	(mole)	(\div)
Potassium	.2361	39 g/mol	.00605	.00605 \div .00605 = 1
Sulfur	.1936	32 g/mol	.00605	.00605 \div .00605 = 1
Oxygen	.3865	16 g/mol	.0241	.0241 \div .00605 = 3.99



c) Molar mass = 270.4 g/mol
Empirical formula = KSO_4

$$\hookrightarrow \text{Empirical mass} = 39 \text{ g} + 32 + 4(16) = 135 \text{ g}$$

$$n = \frac{\text{molar mass}}{\text{empirical mass}}$$

$$n = \frac{270.4 \text{ g}}{135 \text{ g}}$$

$$n = 2 \text{ (approx.)}$$

$$2 \times \text{KSO}_4 =$$

