Chapter II.3 Principles of Weighing and Measuring Problem Solutions

3.1 $$\frac{54\text{ mL} - 50\text{ mL}}{50\text{ mL}} \times 100 = 8\%$$

3.2 $$\frac{7\text{ mg} \times 100}{140\text{ mg}} = 5\%$$

3.3 $$\frac{560\text{ mg} - 500\text{ mg}}{500\text{ mg}} \times 100 = 12\%$$

3.4 $$5\% = \frac{6\text{ mg} \times 100}{\text{LWQ}}$$
$$\text{LWQ} = 120\text{ mg}$$

3.5

1. $$5\% = \frac{6\text{ mg} \times 100}{\text{LWQ}}$$
   $$\text{LWQ} = 120\text{ mg}$$
2. $30 \times 4\text{ mg} = 120\text{ mg}$
3. Quantity of lactose diluent:
   a. Total quantity of mixture: $120\text{ mg} \times 30 = 3{,}600\text{ mg}$
   b. $3{,}600\text{ mg} - 120\text{ mg} = 3{,}480\text{ mg}$ of lactose diluent
4. Weigh 120 mg of aliquot (each contains 4 mg of drug and 116 mg of lactose)

Proof: $$\frac{120\text{ mg (AS)}}{3{,}600\text{ mg (dilution)}} = \frac{X\text{ mg (AS)}}{120\text{ mg (aliquot)}}$$
$$X = 4\text{ mg atropine sulfate}$$

3.6

1. $5\% = \dfrac{8\text{ mg} \times 100}{\text{LWQ}}$

   $\text{LWQ} = 160\text{ mg}$
2. $10 \times 16\text{ mg} = 160\text{ mg}$
3. Quantity of diluent:
   a. Total quantity of mixture = 1,600 mg
   b. 1,600 mg – 160 mg = 1,440 mg of diluent
4. Weigh 160 mg of aliquot (each contains 16 mg of candesartan and 144 mg of diluent)

Proof: $\dfrac{160\text{ mg (C)}}{1{,}600\text{ mg (dilution)}} = \dfrac{\text{X mg (C)}}{160\text{ mg (aliquot)}}$

$\text{X} = 16\text{ mg}$

3.7

1. Measure 4 mL of caffeine citrate (5×0.8 mL = 4 mL; multiple = 5)
2. Determine the amount of diluent:
   a. Aliquot is set at 2 mL (smallest measurable volume)
   b. Total amount of stock solution: $2\text{ mL} \times 5 = 10\text{ mL}$
   c. Amount of diluent: 10 mL – 4 mL = 6 mL
3. Measure 2 mL aliquot from stock solution (this will contain 0.8 mL of caffeine citrate)

Proof: $\dfrac{4\text{ mL}}{10\text{ mL}} = \dfrac{\text{X mL}}{2\text{ mL}}$

$\text{X} = 0.8\text{ mL}$

3.8

1. Measure 1 mL of dye solution (20% of 5 mL = 1 mL = MMQ; multiple = 2.5)
2. Determine the amount of diluent:
   a. Aliquot is set at 1 mL
   b. Total amount of stock solution: $1\text{ mL} \times 2.5 = 2.5\text{ mL}$
   c. Amount of diluent: 2.5 mL – 1 mL = 1.5 mL
3. Measure 1 mL aliquot from stock solution (this will contain 0.4 mL of dye)

Proof: $\dfrac{1\text{ mL}}{2.5\text{ mL}} = \dfrac{\text{X mL}}{1\text{ mL}}$

$\text{X} = 0.4\text{ mL}$