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MATH 1020
ePortfolio Project

Suppose 25.6% and 5.7% solutions are available. Our goal is to make 1 L of a 8.3% solution and verify that the strength is correct.

1. Interpret the percent strength 25.6%. (8.6)

$\frac{25.6 \text{ g of pure drug}}{100 \text{ mL of solution}}$

2. Interpret the percent strength 5.7%. (8.6)

$\frac{5.7 \text{ g of pure drug}}{100 \text{ mL of solution}}$

3. Interpret the percent strength 8.3%. (8.6)

$\frac{8.3 \text{ g of pure drug}}{100 \text{ mL of solution}}$

4. Describe how you mix the 25.6% and 5.7% solutions to get 1 L of a 8.3% solution. Round to the nearest natural number in mL. ((13)

Step 1: Find the values for *Shane's Formula*: $F=V*\frac{C-S}{B-S}$ $S<C<B$

V= 100 mL
F= ?
B= 25.6% solution
C= 8.3% solution
S= 5.7% solution
m= minus

5.7% < 8.3% < 25.6% TRUE

1 L = 1000 mL

Step 2: Find F. Plug in the values into the equation.

$F= 1000 \text{ mL}*\frac{8.3\% - 5.7\%}{25.6\% - 5.7\%} \rightarrow F= 1000 \text{ mL}*\frac{2.6\%}{19.9\%} \rightarrow F\sim 131 \text{ mL}$

Step 3: Put 131 mL of B into a container.
Step 4: Add S into the same container until the total volume reads 1000 mL.
Step 5: Mix solution well.
Step 6: Resultant solution (C) has a volume 1000 mL (or 1 L) and the strength is 8.3%.

5. How many mL of the 25.6% solution do you use?

131 mL of 25.6% solution

6. How many grams of pure drug are there in the above volume? Round to the nearest tenth. (8.8)

$$x\% = \frac{x \text{ g of pure drug}}{100 \text{ mL of solution}}$$

$$131 \text{ mL} * \frac{25.6 \text{ g of pure drug}}{100 \text{ mL of solution}} \rightarrow \frac{131 \text{ mL} * 25.6 \text{ g}}{100 \text{ mL}} \rightarrow \frac{3353.6 \text{ g}}{100} \rightarrow 33.5 \text{ g}$$

7. How many mL of the 5.7% solution do you use?

C-B=S → 1000 mL – 131 mL = 896 mL of 5.7% solution

8. How many grams of pure drug are there in the above volume? Round to the nearest tenth.

$$x\% = \frac{x \text{ g of pure drug}}{100 \text{ mL of solution}}$$

$$896 \text{ mL} * \frac{5.7 \text{ g of pure drug}}{100 \text{ mL of solution}} \rightarrow \frac{896 \text{ mL} * 5.7 \text{ g}}{100 \text{ mL}} \rightarrow \frac{5107.2 \text{ g}}{100} \rightarrow 51.1 \text{ g}$$

9. Find the sum of the number of grams of pure drug from the 25.6% and 5.7% solutions.

B + S = x → 33.5 g + 51.1 g = 84.6 g

10. How many grams of pure drug are there in 1 L of the 8.3% solution?

$$x\% = \frac{x \text{ g of pure drug}}{100 \text{ mL of solution}}$$

$$1000 \text{ mL} * \frac{8.3 \text{ g of pure drug}}{100 \text{ mL of solution}} \rightarrow \frac{1000 \text{ mL} * 8.3 \text{ g}}{100 \text{ mL}} \rightarrow \frac{8300 \text{ g}}{100} \rightarrow 83 \text{ g}$$