

## ***Vitamin C in Fruit Juices***

**This titration uses a reaction specific to the Vitamin C (ascorbic acid). This reaction will be used to determine how much juice is needed to satisfy the Daily Recommended Intake (DRI) of Vitamin C for adults.**

### ***PART I:***

Find Molarity of the ascorbic acid solution

- *Use the mass of  $C_6H_8O_6$ , molar mass (molecular weight) and the total volume of solution, to calculate the M of the standard  $C_6H_8O_6$  solution.*

$$M \text{ } C_6H_8O_6 = \text{mass } C_6H_8O_6 \times \left( \frac{1 \text{ mole } C_6H_8O_6}{176.14 \text{ g } C_6H_8O_6} \right) \times \left( \frac{1}{\text{L of soln}} \right)$$

Find the Molarity of the DCP solution

- *Use the M & mL of  $C_6H_8O_6$  and stoichiometry to find moles of DCP.  
Then divide moles of DCP by the L of DCP to find the M of DCP.*

$$\text{moles DCP} = M \text{ } C_6H_8O_6 \times L \text{ } C_6H_8O_6 \times \left( \frac{1 \text{ mole DCP}}{1 \text{ mole } C_6H_8O_6} \right)$$

$$M \text{ of DCP} = (\text{mol DCP}) \times \left( \frac{1}{\text{L DCP}} \right)$$

## **PART II:**

Find the mg of Vitamin C present

- *Use the M & mL of DCP, stoichiometry, and the molar mass (molecular weight) of  $C_6H_8O_6$ , to calculate the mg of  $C_6H_8O_6$ .*

$$\text{mg} = M_{\text{DCP}} \times L_{\text{DCP}} \times \left( \frac{1 \text{ mol } C_6H_8O_6}{1 \text{ mol DCP}} \right) \times \left( \frac{176.04 \text{ g } C_6H_8O_6}{1 \text{ mole } C_6H_8O_6} \right) \times \left( \frac{1000 \text{ mg}}{1 \text{ g}} \right)$$

- *Divide the DRI (90 mg of  $C_6H_8O_6$ ) by mg of  $C_6H_8O_6$  / mL of juice.*

$$\text{mL juice} = \text{DRI mg } C_6H_8O_6 \times \left( \frac{\text{mL juice}}{\text{mg } C_6H_8O_6} \right)$$

$$\text{mL juice} = 90 \text{ mg } C_6H_8O_6 \times \left( \frac{5.00 \text{ mL juice}}{\text{mg } C_6H_8O_6} \right)$$