

### Question #77208, Chemistry / Other

A buffer is created by dissolving 0.450 mol of sodium ascorbate ( $\text{NaC}_6\text{H}_7\text{O}_6$ ) and 0.500 mol of ascorbic acid ( $\text{HC}_6\text{H}_7\text{O}_6$ ) in enough water to create 1.00 L of solution. a) what is the original pH of the buffer

#### Solution:

Henderson–Hasselbalch equation:

$$pH = pK_a + \log \frac{[A^-]}{[HA]}$$
$$[A^-] = \frac{n(A^-)}{V(\text{solution})} = \frac{0.500 \text{ mol}}{1.00 \text{ L}} = 0.500 \frac{\text{mol}}{\text{L}}$$
$$[HA] = \frac{n(HA)}{V(\text{solution})} = \frac{0.450 \text{ mol}}{1.00 \text{ L}} = 0.450 \frac{\text{mol}}{\text{L}}$$

$pK_a$  (first) for ascorbic acid is 4.10.

Using values:

$$pH = 4.10 + \log \frac{0.500 \frac{\text{mol}}{\text{L}}}{0.450 \frac{\text{mol}}{\text{L}}} = 4.10 + 0.05 = 4.15$$

**Answer:**

**4.15**

Answer provided by AssignmentExpert.com