- Regulation of our blood's pH value is of vital importance for our health. In a healthy person the blood pH does not vary by more than 0.2 from the average 7.4. How does our body regulate the pH of blood?

<table>
<thead>
<tr>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

During exercise, CO₂ is produced at a rapid rate in muscle tissue. What effect does this have on the pH of blood? Why?

Hyperventilation (rapid and deep breathing) can occur during intense exertion. What effect does hyperventilation have on the pH of blood? Why?
Find the concentration of $\text{H}_3\text{O}^+$ in a 0.60 M aqueous solution of nitrous acid. The acid dissociation constant of $\text{HNO}_2$ is $K_a = 7.1 \times 10^{-4}$ M.

- An aqueous solution of a weak acid has $[\text{H}_3\text{O}^+] = 2.54 \times 10^{-4}$ M. Find the pH and pOH of the solution.

<table>
<thead>
<tr>
<th>Solution</th>
<th>pH</th>
<th>pOH</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\text{H}_3\text{O}^+$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answer:

$\text{pH} = \_ \_ \_ $  $\text{pOH} = \_ \_ \_ $
Calculate the pH a 0.200 M solution of acetic acid, CH$_3$COOH, at 25 ºC. (The $pK_a$ of acetic acid is 4.76).

$pH = \text{ }$

Solid sodium acetate, NaCH$_3$CO$_2$, (0.15 mol) was dissolved in 0.500 L of 0.200 M acetic acid and the volume made up to 750 mL with water. What is the pH of the resulting solution?

$pH = \text{ }$

How much more NaCH$_3$CO$_2$ needs to be dissolved in the above solution to give a final pH of 5.00?

Answer:
Solution A consists of a 0.15 M aqueous solution of HF at 25 °C. Calculate the pH of Solution A. The \( pK_a \) of HF is 3.17.

\[
\text{pH} = \ \\
\]

At 25 °C, 1.00 L of Solution B consists of 11.62 g of KF dissolved in water. Calculate the pH of Solution B.

\[
\text{pH} = \ \\
\]

Solution B (1.00 L) is poured into Solution A (1.00 L) and allowed to equilibrate at 25 °C. Calculate the pH of the final solution.

\[
\text{pH} = \ \\
\]

If you wanted to adjust the pH of the mixture of Solution A and Solution B to be exactly equal to 3.00, which component in the solution would you need to increase in concentration?