**Lab sheet #3**

**-Preparation of Different Buffer Solutions-**

**Method and calculations:**

1. **Nature of buffers:**

You are provided with: 0.2M solution of CH3COOH and 0.2M solution of CH3COONa.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Solution** | **HA (** CH3COOH**)**  **(ml)** | **A- (** CH3COONa**)**  **(ml)** | **Final volume** | **Calculated pH** | **Measured pH** | **2M HCl**  **(ml)** | **Measured**  **pH** | **The difference** |
| **100%[HA]** | 20 ml | 0 | 20 ml | 2.729 |  | 0.1 |  |  |
| **75%[HA],25%[A-]** | 15 ml | 5 ml | 20 ml | 4.28 |  | 0.1 |  |  |
| **50%[HA],50%[A-]** | 10 ml | 10 ml | 20 ml | 4.76 |  | 0.1 |  |  |
| **25%[HA],75%[A-]** | 5 ml | 15 ml | 20 ml | 5.24 |  | 0.1 |  |  |

1. Determine which the weak acid is and which is the conjugated base [its salt].

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2. Calculate the volume that you must take from CH3COOH and CH3COONa to prepare the following mixtures with final volume of the solution =20 ml:

**1.** 100% [HA] **2.** 75% [HA] , 25% [A-] **3.** 50% [HA] , 50% [A-] **4.** 25% [HA] , 75% [A-]

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3. Mix the solutions properly and measure the pH of final solution.

4. Calculate the pH for each solution mixture and record results in previous table. [pKa= 4.76].

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1. **Preparation of buffer:**

You are provided with **0.2M acetic acid** and **solid sodium acetate.**   
-Prepare 50ml of a 0.19M acetate buffer pH =4.86 if you know that (pKa=4.7).

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🡺 Now, take …….. ml from 0.2M acetic acid and add ……. g from solid sodium acetate and then complete the volume up to 50 ml by addition of water.

1. **Testing for buffering behaviour:**

1. In one beaker add 10ml of 0.19M acetate buffer that you have prepared, and in another beaker add 10ml of 0.2M KCl.

2. Follow the table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Measured pH** | **2M HCl** | **Measured pH** | **Solution** |
|  | 0.1 ml |  | 0.19 M acetate buffer |
|  | 0.1 ml |  | 0.2M KCl. |