**BCH 312 - Exp (4)**

1. *Nature of buffers:*

* **Method**

You are provided with:

* 0.2M solution of CH3COOH/0.2M solution of CH3COONa.
* 0.2M solution of NaH2PO4/ 0.2M Na2HPO4.

a) Determine for your acid-base pair which is the acid component and which is the base component.

b) Prepare mixtures from previously mentioned solutions, ( i.e. acid –base pairs)

*20 ml final volume for each.*

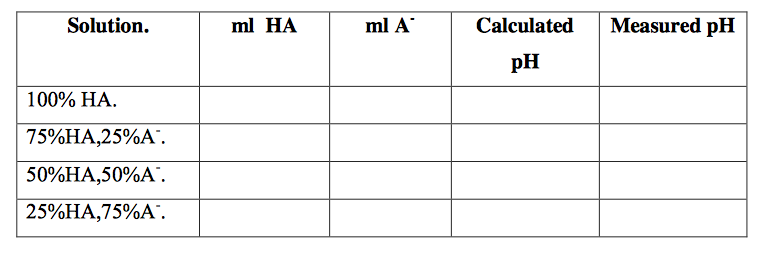
i) 100 % HA. ii) 75 % HA, 25% A- .

iii) 50% HA, 50 % A-. iv) 25% HA, 75% A-.

* Mix solutions properly and measure the pH of final solution.
* Calculate the pH of each solution mixture and record results in following table,

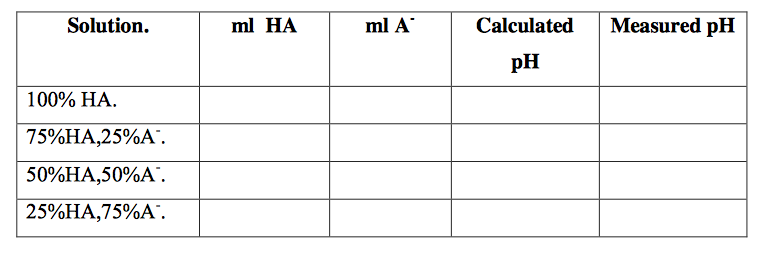
(pKa acetic acid = 4.76 , pKa phosphate = 7.2 )

* **Results**

****Table 1: *For acetic acid/sodium acetate.***

* **Calculations:**

**Table 2: *For NaH2PO4/Na2HPO4.***

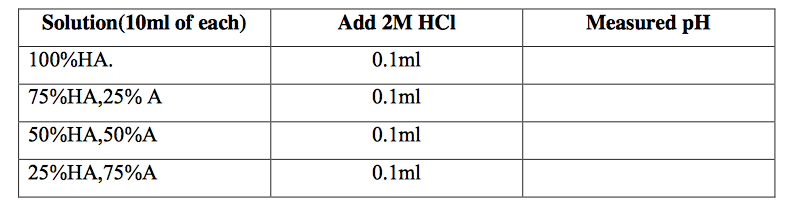
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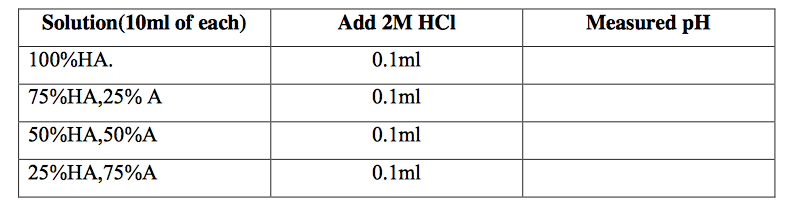
* **Calculations:**

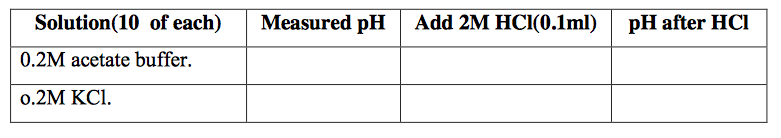
1. *Preparation of buffer:*  
   You are provided with 0.2M solution of acetic acid and solid sodium acetate , (pKa=4.76).Prepare 45ml of a 0.2M acetate buffer pH =4.86.

* **Calculations:**

*3) Testing for buffering behavior:*

**Table 3: *For the acetic acid /sodium acetate mixture.***

**Table 4: *For NaH2PO4/Na2HPO4.***

**Table 5:** ***For the 0.2M acetate buffer prepared:***

* **Discussion:**
* Compare the calculated pH values with the measured pH values in table 1 and 2.
* From the results in table 3, 4 and 5 comment on how the solutions were affected by the (pH of solution) addition of 0.1ml of 2M HCl.
* Show the chemical reaction by which the acetate buffer resisted the change in pH upon addition of HCl?
* State which solutions showed buffering behavior and why?
* How did the measured pH of the 0.2M acetate buffer you prepared in section 2 compare with the requested pH? Comment.
* **Question:**
* If the pH of the acetate buffer you prepared was 5.8 instead of the requested 4.86 what do you think you did wrong that caused this difference in pH?