

The product of  $K_a \times K_b$

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#### SOLVING PROBLEMS INVOLVING $K_a$ and $K_b$

eg. Sodium acetate  $\text{CH}_3\text{COONa}$  is used for developing photos. Find the value of  $K_b$  for the acetate ion. Calculate the pH of a solution that contains 12.5 g of sodium acetate dissolved in 1.00 L of water.

$K_a$  for acetic acid =  $1.81 \times 10^{-5}$

1. Use  $K_a \times K_b = K_w$  to get  $K_b$  of acetate

2. Determine  $[\text{CH}_3\text{COO}^-]$

3. Sodium acetate completely dissociates in water

4. Write chemical equation of  $\text{CH}_3\text{COO}^-$  acting as a base and set up ICE table

	$\text{CH}_3\text{COO}^-_{(\text{aq})} + \text{H}_2\text{O}_{(\text{l})}$	$\rightleftharpoons$	$\text{CH}_3\text{COOH}_{(\text{aq})} + \text{OH}^-_{(\text{aq})}$
I			
C			
E			

5. Write equil. Expression for  $K_b$ .

6. Approximate?

$\therefore$  we can approximate

## BUFFER SOLUTIONS

i.e. adding 10 mL of 1.0 mol/L HCl to water changes pH from 7 - 3 → 4 unit difference.(10000 times change)

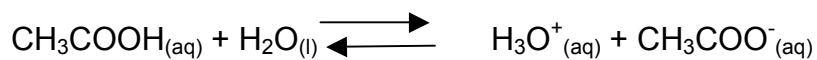
### Methods of making buffered solutions

1.

2.

How does a buffer work?

Eg. Acetic acid and sodium acetate solution:



We have a situation in which an acid and its conjugate base are in high conc.

### Buffer Capacity

### Buffers in Blood

Blood contains a number of buffer systems.

e.g. Hydrogen carbonate - carbonate buffer

read independently.