The product of Ka x Kb

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SOLVING PROBLEMS INVOLVING Ka and Kb

eg. Sodium acetate CH_3COONa is used for developing photos. Find the value of Kb 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.

Ka for acetic acid = 1.81×10^{-5}

1. Use Ka x Kb = Kw to get Kb of acetate

2. Determine $[CH_3COO^-]$

3. Sodium acetate completely dissociates in water

4. Write chemical equation of CH_3COO^- acting as a base and set up ICE table

$CH_3COO^-_{(aq)} + H_2O_{(l)} \rightleftharpoons CH_3COOH_{(aq)} + OH^-_{(aq)}$

I			
C			
E			

5. Write equil. Expression for Kb.

6. Approximate?

∴ we can approximate

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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:

$CH_3COOH_{(aq)} + H_2O_{(l)} \rightleftharpoons H_3O^+_{(aq)} + CH_3COO^-_{(aq)}$

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.