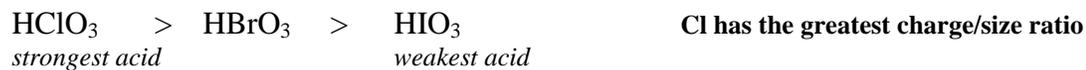
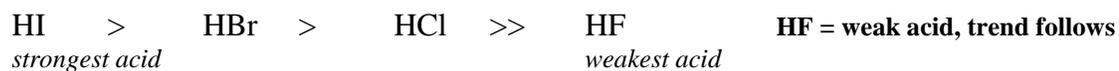


Acids & Bases Notes #3

Acid Strength Trends: (Memorize)



2. Explain the following observations:

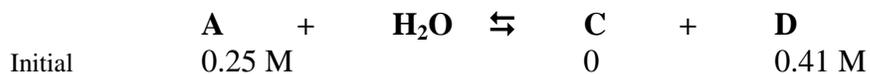
- (a) HNO_3 is a stronger acid than HNO_2
- (b) H_2S is a stronger acid than H_2O
- (c) H_2SO_4 is a stronger acid than H_2SeO_4

3. Complete the following table where $\text{pK}_a = -\log [\text{K}_a]$

Acid	pKa	Ka
A		1.8×10^{-3}
B	4.12	
C	3.34	

4. K_a is related to the strength of an acid. The greater the K_a value, the stronger the acid. Which acid (A, B, or C) shown above would be the strongest?

Consider the following equilibrium system:



Which direction (right or left) will the equilibrium shift immediately?

What is the pH of a 0.30 M HC₂H₃O₂ solution? The K_a for HC₂H₃O₂ is 1.8 x 10⁻⁵.

pH = 2.64

Consider the same reaction, but what will happen to the overall equilibrium pH if 0.30 moles of solid NaC₂H₃O₂ is added to 1 Liter of the 0.30 M HC₂H₃O₂ solution? (assume the solution volume remains 1 Liter)

NaC₂H₃O₂ is a strong electrolyte which breaks apart to produce Na¹⁺ and C₂H₃O₂¹⁻ ions

Buffers

Buffered Systems: resist changes in pH when small amounts of acids or bases are added.

Buffered Systems: contain combinations of **weak acids** and **weak bases**

Common Buffer Combinations:



Buffer Example #1:

What is the pH of a buffer that is 0.12 M **HC**₃H₅O₂ and 0.10 M NaC₃H₅O₂ ? $K_a = 1.3 \times 10^{-5}$

Buffer Example #2:

What is the pH of a buffer made from 0.12 M benzoic acid (**HC**₇H₅O₂) and 0.20 M sodium benzoate (NaC₇H₅O₂) ? $K_a = 6.3 \times 10^{-5}$