General Chemistry II

RR #8
Summer 2022

1. A student prepares a 0.45 M solution of a monoprotic weak acid and determines the pH to be 3.68. What is the K_a of the weak acid?

2. In the lab you make a solution that is 0.0048 M HNO_2 and 0.00056 M $LiNO_2$. What is the pH of your solution? $K_a = 4.5 \times 10^{-4}$

3. Lactate, $CH_3CH(OH)CO_2^-$, is constantly produced from pyruvate during normal metabolism. When the citric acid cycle backs up due to insufficient oxygen supply, lactate builds up in your exercising muscles and you feel that painful burning sensation. Lactate has $K_b = 7.24 \times 10^{-11}$ at 25 ℃.

a. Write the reaction equation described by this K_b.

b. What is the K_a of lactic acid at 25 ℃?

c. If a solution is initially 0.210 M lactic acid, what is the pH at 25 ℃?
You can assume that the K_a is considered very small.

4. Determine whether an aqueous solution of each of the following salts will be acidic, basic, or neutral. You may have to look up and compare K_as and K_bs for a few of these.

$KClO_4$	NaCN	NH_4CH_3COO
NaBr	NH_4ClO	K_2CO_3
$CaBr_2$	NaF	$LiClO_4$
NH_4Br	$NaHCO_3$	$Al_2(SO_4)_3$

5. A 0.150 M solution of morphine ($C_{17}H_{19}NO_3$) has a pH of 10.5 at 25°C. What is morphine's K_b ?