Acid Base Extra Practice

Part 1: Calculating pH

Calculate the pH for each of the following solutions.

1. 0.00867 M $HClO_4$
2. 0.152 M HI
3. 0.00772 M $Ba(OH)_2$
4. 0.000331 M LiOH
5. 1.54 g HNO_3 dissolved in 431 mL
6. 3.61 g $Sr(OH)_2$ dissolved in 1.75 gallons
7. A 0.15 M weak acid solution with a percent ionization of 0.17% (bonus challenge: calculate K_a)
8. A 0.15 M weak base solution with a percent ionization of 0.17% (bonus challenge: calculate K_b)

Part 2: Understanding the pH scale and K_w

1. What is the $[H^+]$ concentration if $[OH^-] = 3.76 \times 10^{-4}$? Is this an acidic or basic solution?
2. What is the $[H^+]$ in a 0.00012 M NaOH solution?
3. What is the pH when $[OH^-] = 1.9 \times 10^{-3}$?

Part 3: Neutralization Reactions

1. What volume of 0.81 M $Ba(OH)_2$ is needed to neutralize 1.78 L 0.052 M CH_3COOH solution?
2. A titration experiment is performed where 1.00 M NaOH is added dropwise to a 50 mL unknown weak acid solution. How many moles of weak acid are in the solution if it takes 12 mL NaOH to neutralize the solution? What is the concentration of the weak acid solution?
3. Determine the relative pH (acidic, basic, or neutral) of the following salts:
    a. $LiCH_3COO$
    b. NaI
    c. NH_4ClO_4

Last challenge question: The Dead Sea has a pH equal to about 5.8 and a volume of 3.01×10^{13} gallons. About many moles of H^+ are in the Dead Sea?