

Acid Base Practice Problems

1. Write the formula for the conjugate acid of the following bases:

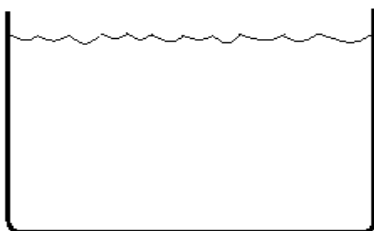
a. CN^- conjugate acid is _____

b. HCO_3^- conjugate acid is _____

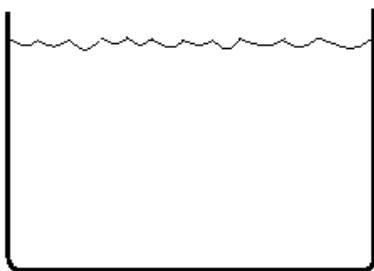
c. NH_3 conjugate acid is _____

d. PO_4^{3-} conjugate acid is _____

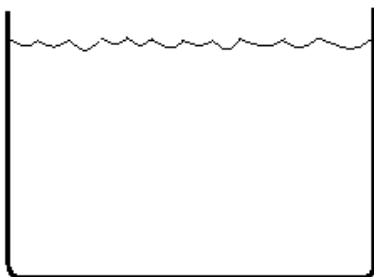
2. Write the balanced reaction for what happens when hydrobromic acid is put in water. Draw the resulting solution in the beaker.



3. Write the balanced reaction for what happens when acetic acid is put in water. Draw the resulting solution in the beaker.



4. Write the balanced reaction for what happens when lithium hydroxide is put in water. Draw the resulting solution in the beaker.



5. If the pOH of a solution is 4.52, calculate the pH, the $[\text{H}^+]$ and the $[\text{OH}^-]$.
Is this solution acidic or basic? _____

When solving problems identification of the chemicals is very important. Is the chemical a strong acid (ionizes 100%), a weak acid (partial ionization and has a K_a), a strong base (ionizes 100%), a weak base (partial ionization and has a K_b), or a salt? If a salt, is it soluble? If yes, are the product ions neutral, acidic or basic? Neutral ions do not react further but acidic and basic ions react with water. Remember acids and acidic ions produce hydronium ions in water while bases and basic ions produce hydroxide ions in water. Good luck!

6. Calculate the pH for a 1.55 M solution of pyridine, an amine, (C_5H_5N). $K_b = 1.7 \times 10^{-9}$

7. Calculate the concentration for a solution of hydroiodic acid that has a pH of 2.583.

8. Identify the following as strong or weak acids, strong or weak bases, neutral salts, basic salts or acidic salts.

$HClO_4$ _____, NH_3 _____, NH_4NO_3 _____,
 H_2SO_4 _____, $Ba(OH)_2$ _____, $LiCH_3COO$ _____,
 HF _____, NaF _____, KOH _____,
 $AlBr_3$ _____, K_2CO_3 _____, $Ba(NO_3)_2$ _____.

9. A 0.125M weak monoprotic acid solution has a pH of 4.25. What is the solution's % ionization?

10. Do this problem on the back of this page. Show all your work including the reactions. Calculate the pH if 3.33 grams of potassium acetate is dissolved in 3.50 liters of water. K_a for acetic acid is 1.8×10^{-5}