

Equilibria involving acids and bases

1. A 0.050 M aqueous solution of hypobromous acid (HOBr) is 0.020% ionized at a certain temperature. What is the value of K_a for hypobromous acid at this temperature?
2. In a 0.0455 M formic acid (HCOOH) solution, what are the equilibrium concentrations of HCOOH, H^+ and $HCOO^-$?
3. Calculate $[OH^-]$ in a 0.060 M NaCN solution. Locate appropriate K value(s) in the text.
4. What are equilibrium concentrations of all solute species in an 0.024 M solution of $NaNO_2$? Locate appropriate K value(s) in the text.
5. (a) In 0.075 M HF, what are the equilibrium concentrations of HF, H^+ , F^- ? What is the % ionization? (b) In a solution that is 0.075 M HF and 0.045 M NaF, what is $[H^+]$? What is % ionization of HF? Compare % ionizations from parts (a) and (b).
6. Calculate the concentration of all solute species present in an aqueous solution (0.070 M) of the diprotic acid maleic acid (abbreviate H_2A). For maleic acid, $K_{a1} = 1.42 \times 10^{-2}$ and $K_{a2} = 8.57 \times 10^{-7}$.
7. Saccharin ($HNC_7H_4SO_3$), a sugar substitute, is a weak acid with $pK_a = 11.68$ at 25 °C. What is the pH of a 0.15 M solution of this substance?
8. Calculate the molar concentration of OH^- ions in a 0.035 M solution of ethylamine ($CH_3CH_2NH_2$). What is the pH of this solution?
9. Calculate $[OH^-]$ and pH for a solution that is 0.085 M in NaOAc and 0.045 M in HOAc.
10. A 0.072 M solution of formic acid that also contains potassium formate has $[H^+] = 2.0 \times 10^{-4}$ M. What is the concentration of potassium formate?