# LECTURE 21

1. Using the values of $K_b$ provided, calculate the pH and $[OH^-]$ for each of the solutions below:
   (a) 0.30 M ammonia ($K_b = 1.8 \times 10^{-5}$)
   (b) 0.54 M hydroxylamine ($K_b = 1.1 \times 10^{-8}$)

2. The following reactions are important for buffer creation in biological chemistry labs. Identify the conjugate acid-base pairs.

   (a) $C_4H_6(OH)_3NH_2\ (aq) + H_2O\ (l) \rightleftharpoons C_4H_6(OH)_3NH_3^+\ (aq) + OH^-\ (aq)$
   (b) $HPO_4^{2-}\ (aq) + HCl\ (aq) \rightleftharpoons H_2PO_4^-\ (aq) + Cl^-\ (aq)$
   (c) $CH_3COOH\ (aq) + H_2O\ (aq) \rightleftharpoons CH_3COO^-\ (aq) + H_3O^+\ (aq)$

3. Ketoacidosis is a serious medical condition caused by a build up of ketone bodies. A 0.50 M solution of one of those ketone bodies, acetoacetic acid, is found to have a pH of 1.95. Determine the $K_a$ of acetoacetic acid.

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