●Acid Base Equilibria

Sore throat medications sometimes contain the weak acid phenol, $HC_6H_5O$. A 0.10 M solution of phenol has a pH of 5.43 at 25°C. What is the acid ionization constant for this acid at 25°C? What is its degree of ionization?

*Para*-hydroxybenzoic acid $K_a=2.6 \times 10^{-5}$ is used to make certain dyes. What is the pH of a 0.200 M aqueous solution of the acid at 25°C? What is the degree of ionization of the acid?

Aniline, $C_6H_5NH_2$, is used in the manufacturing of some perfumes. What is the pH of a 0.035 M solution of aniline? $K_b=4.2 \times 10^{-10}$

Tartaric acid, $H_2C_4H_4O_6$, is a diprotic acid used in food products. What is the pH of a 1.48 M solution of tartaric acid? What is the concentration of $C_4H_4O_6^{2-}$?
$K_{a1}=9.2 \times 10^{-4}$, $K_{a2}=4.3 \times 10^{-5}$

What is the pH of 0.52 M sodium nitrite? Given: $Ka = 4.5 \times 10^{-4}$

●Additional aspects of Acid-Base Equilibria

Calculate the degree of ionization of a 0.15 M benzoic acid solution. $Ka = 6.3 \times 10^{-5}$
Calculate the degree of ionization of a 0.15 M benzoic acid solution that is also 0.010 M HCl.

What is the pH of a buffer made by mixing 1.00 L of 0.020 M benzoic acid with 3.00 L of 0.060 M sodium benzoate? $Ka = 6.3 \times 10^{-5}$

Calculate the pH of a buffer containing 0.25 M $NH_3$ and 0.25 M $NH_4Cl$. What is the pH of the solution after addition of 15.0 mL of 0.10 M NaOH to 50.0 mL of the buffer? $Ka = 5.6 \times 10^{-10}$

What is the pH of the solution that results when 15.00 mL of 0.25 M HCl is added to 55.00 mL of 0.070 M NaOH?

In an experiment, 0.088 M calcium hydroxide is used to titrate 32.00 mL of 0.502 M hypochlorous acid. What is the pH at the equivalence point? $Ka = 3.5 \times 10^{-8}$

A 35.00 mL sample of 0.150 M HClO is titrated with 0.150 M KOH. What is the pH of the solution after addition of 34.40 mL of KOH? $Ka = 3.5 \times 10^{-8}$