4. Benzoic acid, $HC_6H_5CO_2$, is an organic acid whose sodium salt, $NaC_6H_5CO_2$, has long been used as a safe food additive to protect beverages and many foods against harmful yeasts and bacteria. The acid is monoprotic. Write the equation for its K_a.

5. The $[H^+]$ of a 0.10 M solution of cyanic acid (HCNO) is found to be 0.0010 M. Calculate the K_a for cyanic acid.

$$HCNO \leftrightarrow H^+ + CNO^-$$

6. If 1.22 grams of benzoic acid, $HC_6H_5CO_2$, is dissolved in 1.0 L of water, the $[H^+]$ is found to be 8.0×10^{-4} M. Calculate the K_a for benzoic acid.

$$HC_6H_5CO_2 \leftrightarrow H^+ + C_6H_5CO_2^-$$

7. A 0.0050 M solution of butyric acid, HC_4H_7, has a pH =4.0, calculate K_a.

$$HC_4H_7O \leftrightarrow H^+ + C_4H_7O_2^-$$

8. Determine the $[OH^-]$ and the $[H^+]$ of a 0.20 M solution of formic acid. The $K_a = 1.8 \times 10^{-4}$

$$HCOOH \leftrightarrow H^+ + HCOO^-$$