## Let's Practice!

1. Sulfurous acid,  $H_2SO_3$ , is a diprotic acid with  $K_1 = 1.3 \times 10^{-2}$  and  $K_2 = 6.2 \times 10^{-8}$ . Which of the following best represents the relative concentrations of ions in a 2.0 M solution of H<sub>2</sub>SO<sub>3</sub>?

a. 
$$[H_2SO_3] < [SO_3^{2-}] = [HSO_3^{-}]$$

c. 
$$[H_2SO_3] < [HSO_3^-] < [SO_3^{2-}]$$

d. 
$$[H_2SO_3] = [SO_3^{2-}] < [HSO_3^{-}]$$

2. Which of the following ions will have the lowest concentration in a 0.50-molar solution of H<sub>2</sub>SO<sub>4</sub>(aq)?

- 3. Which of the following ions will have the greatest concentration in a 0.02-molar solution of H<sub>2</sub>SO<sub>4</sub>(aq)?
  - a. SO<sub>4</sub><sup>2-</sup>
- HSO<sub>4</sub><sup>-</sup>
- c. H<sub>2</sub>SO<sub>4</sub>
- d. OH
- 4. As the concentration of a weak acid increases, its percent dissociation \_\_\_\_\_\_ and the pH \_\_\_\_\_\_.
  - a. increases, increases

c. increases, decreases

decreases, decreases

- d. decreases, increases
- 5. The acid dissociation constants of phosphoric acid ( $H_3PO_4$ ) are  $K_{a1} = 8 \times 10^{-3}$ ,  $K_{a2} = 6 \times 10^{-8}$  and  $K_{a3} = 4 \times 10^{-13}$  at 298 K. What is the pH of a 5.0 M aqueous solution of phosphoric acid?

$$K_{q} = \frac{x^{2}}{EHAJ} = \frac{x^{2}}{5} = 8E-3 \Rightarrow x = \sqrt{5(8E-3)}$$

$$= \sqrt{40E-3} = \sqrt{4E-2}$$

6. A 0.10 M acid solution has a pH of 2.00. The acid could be:

a. HNO<sub>3</sub>

00. The acid could be: 
$$\Rightarrow pH = -log(IE-I)$$

c.  $CH_3COOH$  d.  $HCIO_3$  = 1

any of these = all weak! (coops)

- 7. When a solution of pure water has a pH of 7.5, the temperature is \_\_\_\_\_ and the solution is \_\_\_\_
  - a. less than 25°C, basic

c. greater than 25°C, basic

b.) less than 25°C, neutral

d. greater than 25°C, neutral