

POLYPROTIC ACIDS

NAME _____

SECTION _____

1. Refer to the data you obtained earlier (Acids, Bases, and pH, pg. 55). Compare the pH and $[H^+]$ of H_2SO_4 with that of HCl and HNO_3 . How do you account for any differences?
2. H_2SO_4 is a polyprotic acid. What does this term mean? Write the equations which describe the step-wise dissociation of H_2SO_4 .
3. Carbonic acid, H_2CO_3 , is a diprotic acid.
 - a. Write the two dissociation reactions showing its diprotic behavior.
 - b. If the initial concentration of H_2CO_3 is 0.100 M, calculate $[H^+]$. In your calculation, assume only the first dissociation occurs. (Note: The equilibrium constant for the first dissociation, K_{a1} , is 4.3×10^{-7} .)

- c. Now consider the second dissociation equation for which $K_{a2} = 5.6 \times 10^{-11}$. What is the initial concentration of $[\text{HCO}_3^-]$? What is the initial concentration of $[\text{H}^+]$? Calculate the final $[\text{H}^+]$ assuming the second dissociation occurs.