

AP Questions: Acids and Bases – in class chapter 15 review

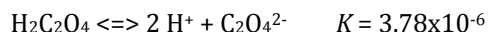
1981 D

- (a) Predict whether a 0.10 molar solution of each of the salts below is acidic, neutral or basic.
- (b) For each of the solutions that is not neutral, write a balanced chemical equation for a reaction occurring with water that supports your prediction.



1997 A

The overall dissociation of oxalic acid, $\text{H}_2\text{C}_2\text{O}_4$, is represented below. The overall dissociation constant is also indicated.



- (a) What volume of 0.400-molar NaOH is required to neutralize completely a 5.00×10^{-3} -mole sample of pure oxalic acid?
- (b) Give the equations representing the first and second dissociations of oxalic acid. Calculate the value of the first dissociation constant, K_1 , for oxalic acid if the value of the second dissociation constant, K_2 , is 6.40×10^{-5} .
- (c) To a 0.015-molar solution of oxalic acid, a strong acid is added until the pH is 0.5. Calculate the $[\text{C}_2\text{O}_4^{2-}]$ in the resulting solution. (Assume the change in volume is negligible.)
- (d) Calculate the value of the equilibrium constant, K_b , for the reaction that occurs when solid $\text{Na}_2\text{C}_2\text{O}_4$ is dissolved in water.

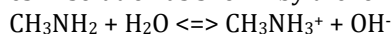
1990 D

Give a brief explanation for each of the following.

- (a) For the diprotic acid H_2S , the first dissociation constant is larger than the second dissociation constant by about 10^5 ($K_1 \sim 10^5 K_2$).
- (b) In water, NaOH is a base but HOCl is an acid.
- (c) HCl and HI are equally strong acids in water but, in pure acetic acid, HI is a stronger acid than HCl .
- (d) When each is dissolved in water, HCl is a much stronger acid than HF .

1980 A

Methylamine CH_3NH_2 , is a weak base that ionizes in solution as shown by the following equation.



- (a) At 25°C the percentage ionization in a 0.160 molar solution of CH_3NH_2 is 4.7%. Calculate $[\text{OH}^-]$, $[\text{CH}_3\text{NH}_3^+]$, $[\text{CH}_3\text{NH}_2]$, $[\text{H}_3\text{O}^+]$, and the pH of a 0.160 molar solution of CH_3NH_2 at 25°C .
- (b) Calculate the value for K_b , the ionization constant for CH_3NH_2 , at 25°C .