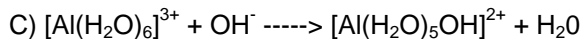
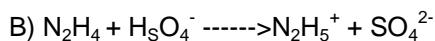
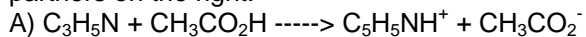


6. Write balanced equations showing how the  $\text{HPO}_4^{2-}$  ion of sodium hydrogen phosphate,  $\text{Na}_2\text{HPO}_4$ , can be a Bronsted acid or Bronsted base.

8. In each of the following acid-base reactions, identify the Bronsted acid and base on the left and their conjugate partners on the right.



14. The pH of a solution of  $\text{Ba}(\text{OH})_2$  is 10.66 at 25 deg. Celsius. what is the Hydroxide ion concentration in the solution? If the solution volume is 125 ml, how many grams of  $\text{Ba}(\text{OH})_2$  must have been dissolved?

42. A .10M solution of chloroacetic acid,  $\text{ClCH}_2\text{CO}_2\text{H}$ , has a pH of 1.95. Calculate  $K_a$  for the acid.

48. The ionization constant of a very weak acid, HA, is  $4.0 \times 10^{-9}$ . Calculate the equilibrium concentration of  $\text{H}_3\text{O}^+$ ,  $\text{A}^-$ , and HA in a .400 M solution of the acid.

86. The butylammonium ion,  $\text{C}_4\text{H}_9\text{NH}_3^+$ , has a  $K_a$  of  $2.3 \times 10^{-11}$   
 $\text{C}_4\text{H}_9\text{NH}_3^+ + \text{H}_2\text{O} \rightarrow \text{H}_3\text{O}^+ + \text{C}_4\text{H}_9\text{NH}_2$

A) calculate  $K_b$  for the conjugate base,  $\text{C}_4\text{H}_9\text{NH}_2$

B) What is the pH of .015 M solution of the butylammonium ion?

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