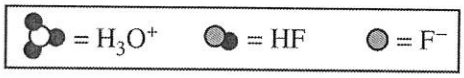
$$HF(aq) + H_2O(l) \rightleftarrows F^-(aq) + H_3O^+(aq)$$

5. The ionization of HF(aq) in water is represented by the equation above. In a 0.0350 M HF(aq) solution, the percent ionization of HF is 13.0 percent.

   (a) Two particulate representations of the ionization of HF molecules in the 0.0350 M HF(aq) solution are shown below in Figure 1 and Figure 2. Water molecules are not shown. Explain why the representation of the ionization of HF molecules in water in Figure 1 is more accurate than the representation in Figure 2. (The key below identifies the particles in the representations.)



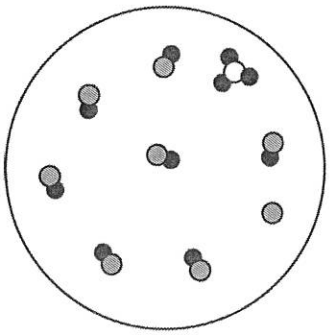


Figure 1

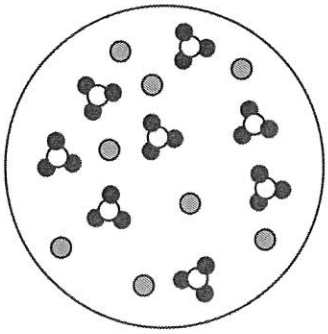


Figure 2

   (b) Use the percent ionization data above to calculate the value of K_a for HF.

   (c) If 50.0 mL of distilled water is added to 50.0 mL of 0.035 M HF(aq), will the percent ionization of HF(aq) in the solution increase, decrease, or remain the same? Justify your answer with an explanation or calculation.

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