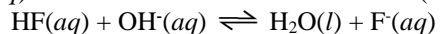




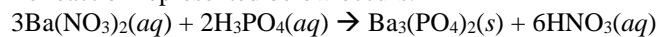
2.  $\text{HF}(aq)$  is a weak acid. It reacts with  $\text{NaOH}(aq)$  according to the reaction represented below.



A volume of 35 mL of 0.39 M  $\text{NaOH}(aq)$  is added to 45 mL of 0.40 M  $\text{HF}(aq)$  solution. Assume that volumes are additive.

- (a) Calculate the number of moles of  $\text{HF}(aq)$  remaining in the solution.
- (b) Calculate the molar concentration of  $\text{F}^-(aq)$  in the solution.

In a reaction vessel, 0.900 mol of  $\text{Ba}(\text{NO}_3)_2(s)$  and 0.400 mol of  $\text{H}_3\text{PO}_4(aq)$  are combined with deionized water to a final volume of 2.00 L. The reaction represented below occurs.



- (c) Calculate the mass of  $\text{Ba}_3(\text{PO}_4)_2(s)$  formed.
- (d) What is the concentration, in  $\text{mol L}^{-1}$ , of the nitrate ion,  $\text{NO}_3^-(aq)$ , after the reaction reaches completion?
- (e) What is the concentration, in  $\text{mol L}^{-1}$ , of the barium ion,  $\text{Ba}^{2+}(aq)$ , after the reaction reaches completion?

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