

1. For a 1.025 *M* FeCl₃ solution, calculate the
 - (a) volume of solution containing 11.4 g FeCl₃
 - (b) number of moles of FeCl₃ in 555 mL of solution
 - (c) number of moles of chloride ion in 125 mL of solution
 - (d) mass of FeCl₃ in 1.65 L of solution
 - (e) molarity of the resulting solution if 25.0 mL of the 1.025 *M* solution is added to 125.0 mL of water
 - (f) volume of the 1.025 *M* solution which must be diluted to 500.0 mL to obtain a 0.0925 *M* solution
 - (g) the molarity of the resulting solution if 75.0 mL of the 1.025 *M* solution is added to 50.0 mL of a 1.875 *M* FeCl₃ solution.

2. For the reaction $\text{FeCl}_3(aq) + 3\text{KOH}(aq) \rightarrow \text{Fe}(\text{OH})_3(s) + 3\text{KCl}(aq)$
 - (a) what volume of 0.1189 *M* FeCl₃ is needed to form 1.38 g of Fe(OH)₃?
 - (b) what volume of 0.205 *M* KOH is needed to react with 25.0 mL of 0.1189 *M* FeCl₃?
 - (c) what volume of 0.1189 *M* FeCl₃ is needed to react with 0.184 g of KOH?
 - (d) what volume of 0.1189 *M* FeCl₃ is needed to react with 0.265 g of 85.0% KOH?

3.
 - (a) What is the molarity of NaNO₃ in a solution containing 1.38 g of NaNO₃ in 875 mL of solution?
 - (b) Given that the density of the solution is 1.00 g/mL, what is the percent (by mass) of NaNO₃ in a 0.235 *M* solution?

4. For the reaction $\text{KOH}(aq) + \text{HCl}(aq) \rightarrow \text{KCl}(aq) + \text{H}_2\text{O}(l)$
 - (a) what is the molarity of the HCl solution if 23.4 mL of 0.08652 *M* KOH was required to titrate 25.0 mL of the HCl solution?
 - (b) what volume of 0.09785 *M* KOH is required to titrate 25.0 mL of 0.1007 *M* HCl?