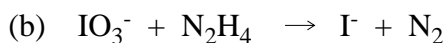
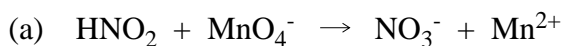
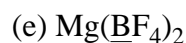
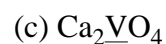
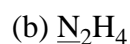
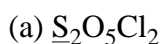


1. Complete and balance the following equations for the redox reactions that occur in acidic solution:



In each case, identify the oxidizing agent and the reducing agent.

2. In each case, calculate the oxidation number for the underlined element:



3. How many grams of naphthalene,  $\text{C}_{10}\text{H}_8$ , should be dissolved in 300.0 g of nitrobenzene to produce a solution of freezing point  $3.00^\circ\text{C}$ ? The freezing point of nitrobenzene is  $5.70^\circ\text{C}$  and  $k_f$  for nitrobenzene =  $7.00^\circ\text{C}/m$ .

4. A solution that contains 22.0 g of ascorbic acid in 100.0 g of water freezes at  $-2.33^\circ\text{C}$ . Calculate the molecular weight of ascorbic acid.  $k_f$  for water =  $1.86^\circ\text{C}/m$ .

5. Calculate the molality of commercial muriatic acid, an aqueous solution of HCl which is 37% HCl by mass.

6. Calculate the percent by mass of NaCl in a 1.5 molal aqueous solution.

7. Calculate the molality of a 2.0 M solution of  $\text{LiBH}_4$  in THF ( $\text{C}_4\text{H}_8\text{O}$ ). The density of the solution is 0.896 g/mL.