

Unit 4 – Chapter 4 Pre-Lab Questions:

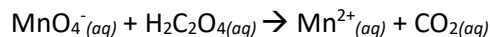
Name _____

Permanganate Determination of the Iron Sample

Period _____

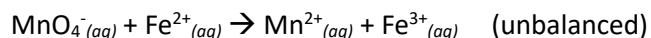
Redox prelab problems:

- 1) A solution of permanganate was standardized by titration with oxalic acid ($\text{H}_2\text{C}_2\text{O}_4$). It required 28.97 mL of the permanganate solution to react completely with 0.1058 grams of oxalic acid. The unbalanced equation for the reaction is:

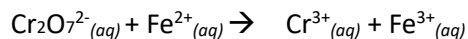


Calculate the molarity of the permanganate solution.

- 2) A 50.00 mL sample of solution containing Fe^{2+} ions is titrated with a 0.0216 M KMnO_4 solution. It required 20.62 mL of the KMnO_4 solution to oxidize all the Fe^{2+} ions to Fe^{3+} ions by the reaction:



- a. What was the concentration of the Fe^{2+} ions in the sample solution?
b. What volume of 0.0150 M $\text{K}_2\text{Cr}_2\text{O}_7$ solution would it take to do the same titration? The reaction is:



- 3) The iron content of iron ore can be determined by titration with standard KMnO_4 solution. The iron ore is dissolved in HCl and all the iron is reduced to Fe^{2+} ions. This solution is then titrated with KMnO_4 solution, producing Fe^{3+} and Mn^{2+} ions in acidic solution. If it required 41.95 mL of 0.0205 *M* KMnO_4 to titrate a solution made from 0.6128 grams of iron ore, what is the mass percent of iron in the iron ore?