FLINN SCIENTIFIC

Name_____

Analysis of Hydrogen Peroxide

Data Table

	Trial 1	Trial 2	Trial 3
Molarity of $KMnO_4$ solution (M)			
Initial volume $KMnO_4$ solution (mL)			
Final volume $KMnO_4$ solution (mL)			
Volume of $KMnO_4$ added to flask (mL)			

Post-Lab Calculations and Analysis *(Use a separate sheet of paper to answer the following questions.)*

Construct a Results Table to summarize the results of the following calculations (#1–5):

1. Multiply the molarity of the $KMnO_4$ solution by the volume added to the flask to calculate the number of moles of permanganate ion consumed in each trial. *Hint:* What are the units of molarity?
2. Multiply the number of moles of permanganate ion by the mole ratio for hydrogen peroxide (see the *Pre-Lab Questions*) to determine the number of moles of hydrogen peroxide for each trial.
3. Multiply the number of moles of hydrogen peroxide by the molar mass of hydrogen peroxide to determine the number of grams of hydrogen peroxide for each trial.
4. For each trial, divide the number of grams of hydrogen peroxide by the total mass of the hydrogen peroxide *solution* (see step 7 in the *Procedure*), and multiply the answer by 100. The result is the *percent hydrogen peroxide* in the commercial antiseptic. *Note:* Assume the density of the commercial antiseptic solution is 1.00 g/mL.
5. Determine the average value for the percent hydrogen peroxide in the commercial solution and compare the value with the concentration reported on the product label.
6. If an insufficient amount of acid is added in step 9, some of the MnO_4^- ions will be reduced to MnO_2 instead of to Mn^{2+}.
   a. How would this change the mole ratio for the titration reaction?
   b. How would this affect the volume of $KMnO_4$ solution needed to reach the endpoint?
   c. If reduction to MnO_2 were occurring but not being reflected in the calculations, would the calculated percent hydrogen peroxide be too high or too low as a result of this error?