8 Bleach Analysis

Seen

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Lab. Instructor ..... Date 10/5

Pre-Laboratory Questions

1. Write balanced equation(s) for the reactions involved in standardization of sodium thiosulfate.

$6S_2O_3^{-2} + Cr_2O_7^{-2} + 14H^+ \rightarrow 3S_4O_6^{-2} + 2Cr^{+3} + 7H_2O$

2. In today's chemical analysis of bleach solution, what substance is oxidized by the hypochlorite (OCl^-) ion?

I^-

3. What are the formulas of sodium thiosulfate and hypochlorite ion?

sodium thiosulfate = $Na_2S_2O_3$ / Hypochlorite ion = OCl^-

4. Does sodium thiosulfate serve as an oxidizing agent or as a reducing agent? What does sodium thiosulfate reduce?

$Na_2S_2O_3$ = Reducing agent

I_3^- = oxidizing agent

$Na_2S_2O_3$ reduced I_3^-

B. Analysis of bleach solution

	Trial (I)	Trial (II)
Dilution Factor	30	30
Volume of bleach solution	25 mL	25 mL
Initial buret reading	0.0 mL	1.80 mL
Final buret reading	1.80 mL	3.80 mL
Volume of $Na_2S_2O_3$ solution	1.80 mL	2 mL
Number of moles of $Na_2S_2O_3$ oxidized	$,18 \times 10^{-3}$ mol	$,2 \times 10^{-3}$ mol
Number of moles of ClO^- reduced	$,09 \times 10^{-3}$ mol	$,1 \times 10^{-3}$ mol
Molarity of diluted bleach solution	3.6×10^{-3} M	4×10^{-3} M
Molarity of original bleach solution	,108 M	,12 M
Average molarity of original bleach solution	,114 M	
Mass% of NaClO(assume density of bleach solution = 1.00g/mL)	,026 %	

m NaClO = $,09 \times 10^{-3} \cdot 74.44$

$= 6.699 \times 10^{-3}$

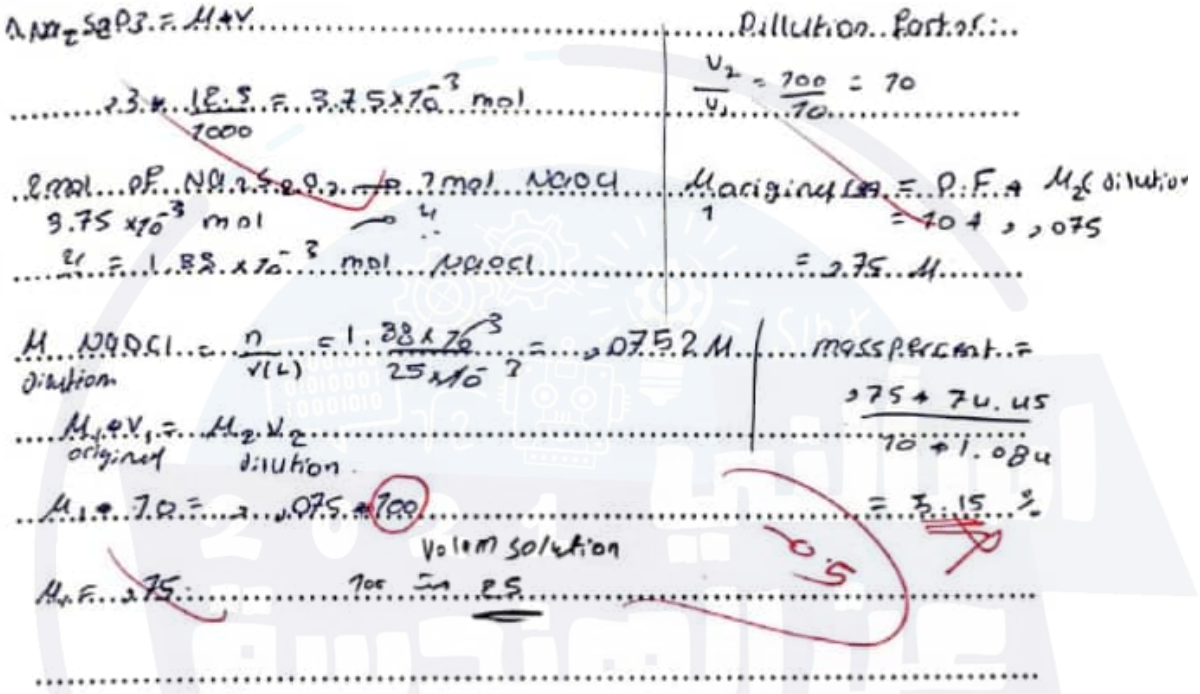
m Bleach = d.v.

= 1.25

= 25

QUESTIONS

1. A 10.0 mL bleach sample is diluted to 100 mL in a volumetric flask. A 25.0 mL of this solution is analyzed according to the procedure in this experiment. If 12.5 mL of 0.30 M $Na_2S_2O_3$ is needed to reach the end point, calculate the mass percent of NaClO in the original sample? (Assume the density of bleach solution is 1.084 g/mL).



2. A bleach solution that is 6.58% NaClO (density= 1.10 g/mL) was diluted to 0.056 M concentration. Calculate dilution factor.