

Chemistry 1210
Oxidation Reduction Analysis

Name: _____

Date: _____

OBJECT: To quantitatively determine the % Iron in an Unknown Iron sample.

PROCEDURE: As in the Chemistry 1210 lab manual, page 38-39.

OBSERVATIONS:

DATA:

Standardization of KMnO_4

	Run 1	Run 2	Run 3	Run 4 (if required)
Mass of weigh boat + sample				
Mass of empty boat				

	Calculated Mass $\text{Na}_2\text{C}_2\text{O}_4$	Initial Volume KMnO_4	Final Volume KMnO_4	Volume KMnO_4 Delivered	Endpoint Shade and Colour	$\frac{\text{Volume Delivered}}{\text{Mass of Sample}}$
1						
2						
3						
4						

Determination of % Iron in an unknown Iron Sample

Unknown # _____

	Run 1	Run 2	Run 3	Run 4 (if required)
Mass of weigh boat + sample				
Mass of empty boat				

	Calculated Mass Unknown Iron Sample	Initial Volume KMnO_4	Final Volume KMnO_4	Volume KMnO_4 Delivered	Endpoint Shade and Colour	$\frac{\text{Volume Delivered}}{\text{Mass of Sample}}$
1						
2						
3						
4						

CALCULATIONS:

Calculate the percent difference between the volume/mass ratios. Only those runs within 1% should be used for subsequent calculations.

Show a sample calculation for the molarity of the standardized KMnO_4 solution.

Trial	1	2	3	4	Average
$[\text{KMnO}_4]$					
Was run used in selecting average?					

Show a sample calculation for the % Iron in the unknown iron sample.

Trial	1	2	3	4	Average
% Iron					
Was run used in selecting average?					

RESULTS: (attach spreadsheet)

[KMnO ₄]	% Fe in Unknown # _____

DISCUSSION:

QUESTIONS:

1. How would the experimentally determined percent by mass of Fe be affected if the sodium oxalate used to standardize the KMnO₄ was impure (e.g. slightly wet)?

2. Briefly explain your choice of titration data used to calculate the permanganate concentration (consider the volume/mass ratios).