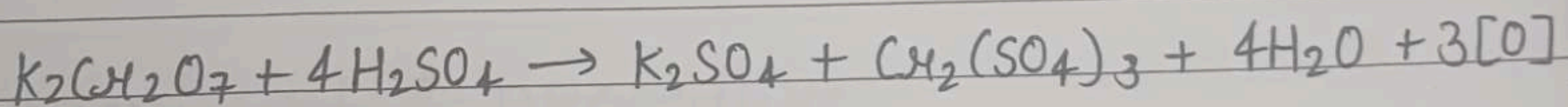


Experiment - 1

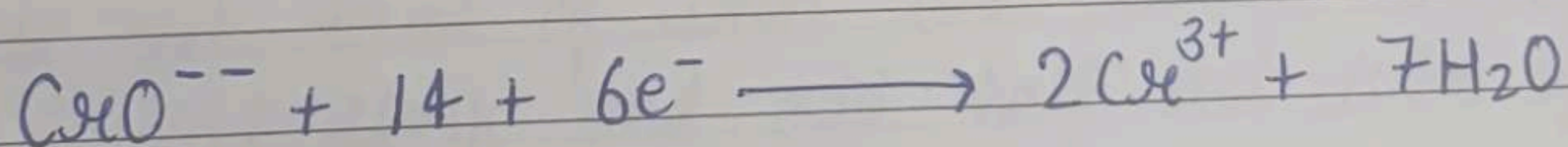
Aim - Determination of Fe^{2+} ion content in the give iron ore sample solution.

Objective - To determine the ferrous ion (Fe^{2+}) content in give sample solution of iron ore or Mohr's salt, $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ by titrating it against a standard N/30 potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) solution using potassium ferricyanide, $\text{K}_3[\text{Fe}(\text{CN})_6]$, as an external indicator by redox titration.

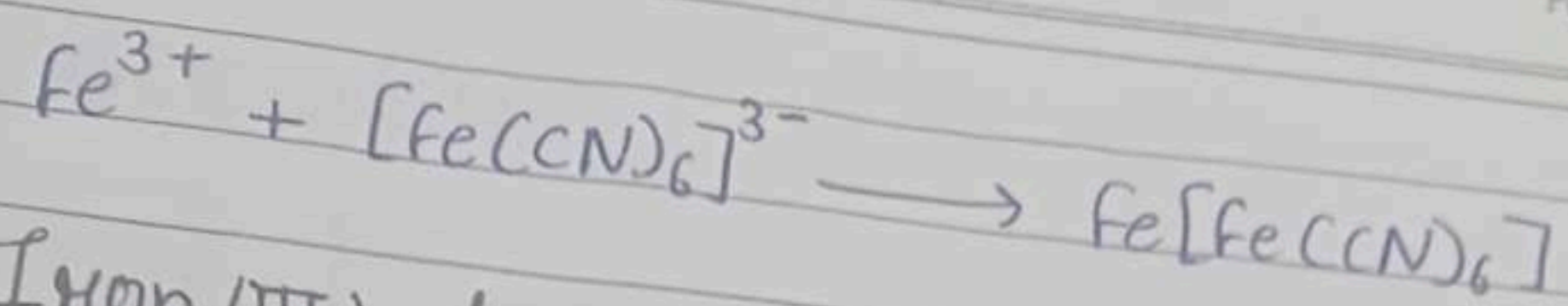
Theory - potassium dichromate [$\text{K}_2\text{Cr}_2\text{O}_7$] acts as an oxidizing agent in an acidic medium, and each molecule of it gives three atoms of nascent oxygen. The following reaction takes place:



The Ionic Equation



Teacher's Signature.....



Iron (III) hexacyanoferrate III

(Colourless)

Experimental Setup:

Apparatus- Burette, pipette, conical flask, Beaker, funnel, glass rod, droppers, white glazed tile.

Chemicals:- Standard N/30 potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) solution, Unknown sample, Solution of Iron (Mohr's salt).

Indicator:- Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$
I.U.P.A.C name-
Potassium hexacyanoferrate (III)

Experimental procedure-

1. Pipette out 10ml of iron ore sample solution in a conical flask and add half test tube of dilute H_2SO_4 to it.
2. Fill the burette with standard N/30, $\text{K}_2\text{Cr}_2\text{O}_7$ solution up to zero mark.

Teacher's Signature.....

metimes also referred as the Irving William order of
es is consistent of charge-to-radius ratio concept, since

Class a metals from more stable complexes with ligands having the coordinating atoms from the
second period elements (for example N, O, F) than those of an analogous ligand in which the donor
atom is from third or later period (for example P, S, Cl).
On the other hand, class b metals have the relative stabilities reversed. If the ligand contains the heavier
donor atoms, class a and b metals are characterized by the stability order:

Expt. No. 1

Date 3/09/2026

Page No. 3

Observation:-

S.No	Volume of Sample Sol ⁿ taken	Burette reading (Initial)	Burette readings (Final)	Range (change)	Volume of $K_2Cr_2O_7$ (N/30) (consumed)
1.	10ml	0	10		
2.	10ml	0	11	10-11	11
3.	10ml	0	11		

Calculation:-

Let N_1 be the Normality of Mohr's salt solution, then:

Mohr's Salt solution = Potassium Dichromate solution

$$N_1 V_1 = N_2 V_2$$

$$N_1 = \frac{N_2 V_2}{V_1} = \frac{\frac{1}{30} \cdot 11}{10} = \frac{11}{300}$$

$$N_1 = 0.036 N$$

Strength calculation:

$$\begin{aligned} \text{Strength in gram per litre} &= \text{Normality} \times \text{Equivalent weight of } Fe^{2+} \\ &= 0.036 \times 56 \\ &= 2.016 \text{ g/l} \end{aligned}$$

Result: The ferrous ion content in the given iron ore solution is 2.016 gm/litre

Teacher's Signature.....

Precautions :-

- Apparatus cleaning: Wash the glass apparatus properly before the start of experiments.
- Medium Control: $K_2Cr_2O_7$ acts as an oxidising agent in acidic medium only, so don't forget the addition of dilute H_2SO_4 solution to the Mohr's Salt solution.
- Rinsing Routine: The glass should be washed each time before using for withdrawing a drop from the conical flask, otherwise the titrating solution will become blue.