

Iron Data Sheet

Pre-Lab Activity

Test Tube	Solution 1	Oxidation # of Iron	Solution 2	Oxidation # of Iron
1	Iron(II) sulfate FeSO_4		Potassium ferrocyanide $\text{K}_4[\text{Fe}(\text{CN})_6]$	
2			Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$	
3			Potassium thiocyanate KSCN	
4	Iron(III) chloride FeCl_3		Potassium ferrocyanide $\text{K}_4[\text{Fe}(\text{CN})_6]$	
5			Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$	
6			Potassium thiocyanate KSCN	

Show all work.

Redox Observations

Test Tube	Solution 1	Solution 2	Observations
1	Iron(II) sulfate FeSO_4	Potassium ferrocyanide $\text{K}_4[\text{Fe}(\text{CN})_6]$	
2		Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$	
3		Potassium thiocyanate KSCN	
4	Iron(III) chloride FeCl_3	Potassium ferrocyanide $\text{K}_4[\text{Fe}(\text{CN})_6]$	
5		Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$	
6		Potassium thiocyanate KSCN	

Determination of Unknown

Test Tube	Solution 1	Solution 2	Observations	Oxidation # of Iron
1	Iron-containing solution	Potassium ferrocyanide $\text{K}_4[\text{Fe}(\text{CN})_6]$		
2		Potassium ferricyanide $\text{K}_3[\text{Fe}(\text{CN})_6]$		
3		Potassium thiocyanate KSCN		

Post-Lab Questions

1. How can potassium thiocyanate be used to confirm that Fe^{2+} ions have been oxidized to Fe^{3+} ? Will tube 1 eventually turn Prussian blue?
2. How can potassium ferricyanide be used to confirm that Fe^{3+} ions have been reduced to Fe^{2+} ?
3. Use the oxidation state rules to assign oxidation states for the indicated atoms in each oxidizing agent and its product. Show your work.

Atom	Oxidizing Agent	Oxidation State
Mn	MnO_4^-	
O	H_2O_2	
Cl	OCl^-	
I	IO_3^-	
S	SO_4^{2-}	

4. Circle the correct choices to complete the following definitions.
 - a. An oxidizing agent is a substance that causes the (*oxidation/reduction*) of another reactant in a redox reaction. The oxidation state of the oxidizing agent (*increases/decreases*), and the oxidizing agent itself undergoes (*oxidation/reduction*) during the reaction.
 - b. A reducing agent is a substance that causes the (*oxidation/reduction*) of another reactant in a redox reaction. The oxidation state of the reducing agent (*increases/decreases*), and the reducing agent itself undergoes (*oxidation/reduction*) during the reaction.