**Student Worksheet**

**Practical 4: Redox reagents**

**Procedure**

1. Fill a test tube 1cm depth with iron ion solution.
2. Add 1cm of redox reagent and warm if necessary.
3. **Add NaOH to enhance the colour. Pour some out and keep adding until the precipitate forms**
4. Record the colour changes in the table.
5. If there is no change, put a line through that box.
6. Use the table below to decide whether each set of reagents are **oxidising** or **reducing agents**

**Background**

1. Iron ions can exist as Fe2+ and Fe3+:
2. Fe2+ solutions are green and Fe3+ solutions are brown.

Fe2+   Fe3+   +    e-   **Oxidation (Needs oxidising agent)**

Green    Brown

Fe3+  + e-  Fe2+      **Reduction (Needs reducing agent)**

Brown          Green

1. It is possible to convert Fe2+ to Fe3+ and Fe3+ to Fe2+.  These are oxidation or reduction reactions.
2. You need to decide which conversion is which.
3. You are provided with solutions of Fe2+ and Fe3+.
4. You are also provided with 5 sets of reagents that are either oxidising agents or reducing agents.

**Analysis of results**

**Copy this table out**

|  |  |  |
| --- | --- | --- |
| **Redox Reagent** | **Colour change (if any)** | **Type of reagent** |
| **Fe2+(aq)** | **Fe3+(aq)** |
| Same volume of Hydrogen peroxide, H2O2 |  |  |  |
| 5 drops of Potassium manganate (VII), KMnO4 |  |  |  |
| 5 drops Conc Nitric/warm for ~5 mins |  |  |  |
| ½ spatula of zinc/warm for ~5 mins |  |  |  |
| Same volume of Sodium sulphite/warm for ~5 mins |  |  |  |

**Equipment/materials**

* Conc nitric acid
* 20vol hydrogen peroxide
* Zn powder
* 0.1M sodium sulphite
* 0.05M potassium permanganate mixed with an equal vol of 1M sulphuric acid
* 0.1M Ammonium iron (II) sulphate mixed with a bit of 1M sulphuric acid
* 0.1M iron (III) chloride mixed with a bit of 1M sulphuric acid

**Objective**

* Be able to determine an oxidising and reducing agent.

**Safety**

* **Strong oxidising and reducing agents**



Harmful



Harmful

**Questions**

1. Use the table below to decide whether a redox reaction has occurred
2. Work out what change has occurred for the reactions that show a colour change.
3. What type of reagent is each of reagents, **oxidising** or **reducing agents?**