Green iron(II) sulfate solution is oxidised by a purple potassium permanganate solution, to give a colourless solution of iron(III) and manganese(II).

**EQUIPMENT**
- 100 mL measuring cylinder
- 2 L conical flask
- long glass rod
- light box

**REAGENTS**
- potassium permanganate, KMnO₄ (a few crystals)
- iron(II) ammonium sulfate-6-water, (NH₄)₂Fe(SO₄)₂·6H₂O or Iron (ll) sulfate (50 g)
- sulfuric acid, H₂SO₄ (2 M, 100 mL)
- distilled water

**PREPARATION**
- Dissolve 50 g iron (II) ammonium sulfate-6-water or Iron (ll) sulfate in 150 mL of 2 M sulfuric acid.
- Set up the light box.
- Fill the conical flask with water and add crystals of potassium permanganate, sufficient to produce a solution which is strongly coloured without being opaque.
- Provide measuring cylinder and stirring rod.

**PROCEDURE**
- Add 150 mL of the iron(II) sulfate solution to the potassium permanganate solution.
- Stir.

**RESULTS**
Permanganate is reduced to Mn(II) and Fe(II) is oxidised to Fe(III).

The reactions are:
\[
\begin{align*}
\text{Fe}^{2+}(aq) & \rightarrow \text{Fe}^{3+}(aq) + e^- & \mathcal{E}^\circ = & -0.77 \text{ V} \\
\text{MnO}_4^-(aq) + 8\text{H}^+(aq) + 5e^- & \rightarrow \text{Mn}^{2+}(aq) + 4\text{H}_2\text{O}(l) & \mathcal{E}^\circ = & +1.51 \text{ V} \\
\text{MnO}_4^-(aq) + 8\text{H}^+(aq) + 5\text{Fe}^{2+}(aq) & \rightarrow \text{Mn}^{2+}(aq) + 5\text{Fe}^{3+}(aq) + 4\text{H}_2\text{O}(l) & \mathcal{E}^\circ_{\text{cell}} = & +0.74 \text{ V}
\end{align*}
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**High Risk Demonstration:**
- Refer to HIRAC
- Set up in Red Tray