

6) From the equations in exercise 5 identify the **reductant** and the **oxidant**.

a) oxidant: Cr reductant: S

b) oxidant: N reductant: Cu

c) oxidant: O reductant: Fe

7) Split the following equations into **half equations**.

a) $\text{Mg} + \text{H}^+ \rightarrow \text{Mg}^{2+} + \text{H}_2$

Reduction $2\text{H}^+ \rightarrow \text{H}_2 + 2\text{e}^-$

Oxidation $\text{Mg} \rightarrow \text{Mg}^{2+} + \text{e}^-$

b) $\text{Fe}^{2+} + \text{Cl}_2 \rightarrow \text{Fe}^{3+} + \text{Cl}^-$

Reduction $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$

Oxidation $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}^-$

c) $\text{H}^+ + \text{Mg} \rightarrow \text{Mg}^{2+} + \text{H}_2$

Reduction **same as a)!!**

Oxidation

8) **Balance** the following **half equations**.

a) $\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \rightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O}$

b) $\text{CO} + \text{H}_2\text{O} \rightarrow \text{CO}_2 + 2\text{H}^+ + 2\text{e}^-$

c) $\text{I}_2 + 2\text{e}^- \rightarrow 2\text{I}^-$

d) $\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O}$

e) $2\text{S}_2\text{O}_3^{2-} \rightarrow \text{S}_4\text{O}_6^{2-} + 2\text{e}^-$

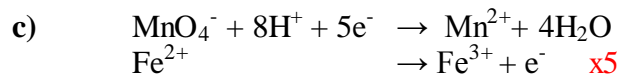
9) **Combine** the following **half equations**.

a) $\text{Cl}_2 + 2\text{e}^- \rightarrow 2\text{Cl}^-$
 $\text{Fe}^{2+} \rightarrow \text{Fe}^{3+} + \text{e}^- \quad \times 2$

$\text{Cl}_2 + 2\text{Fe}^{2+} \rightarrow 2\text{Cl}^- + 2\text{Fe}^{3+}$

b) $\text{H}_2\text{O}_2 + 2\text{H}^+ + 2\text{e}^- \rightarrow 2\text{H}_2\text{O} \quad \times 2$
 $\text{SO}_2 + 2\text{H}_2\text{O} \rightarrow \text{SO}_4^{2-} + 4\text{H}^+ + 4\text{e}^-$

$2\text{H}_2\text{O}_2 + 4\text{H}^+ + \text{SO}_2 \rightarrow 2\text{H}_2\text{O} + \text{SO}_4^{2-} + 4\text{H}^+$



10) Write balanced half equations for each oxidising agent, state any observations



Yellow gas to colourless solution



Orange to green

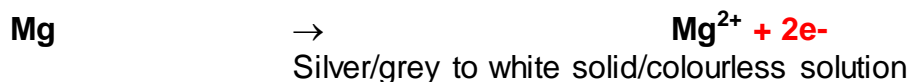
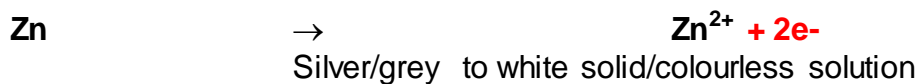


Green to orange



Purple to colourless

11) Write a balanced half equation for each reducing agent, state any observations



Colourless to brown/orange



Colourless to orange



Silver/grey to orange