

Activity 23C: Oxidants and reductants

Ans p. 42

For each of the following reactions, identify the oxidant and the reductant, justifying your answers using oxidation numbers.

1. $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$
2. $\text{Zn} + \text{Cu}^{2+} \rightarrow \text{Zn}^{2+} + \text{Cu}$
3. $\text{H}_2\text{O} + \text{CO} \rightarrow \text{H}_2 + \text{CO}_2$
4. $\text{Mg}(\text{OH})_2 + 2\text{HCl} \rightarrow \text{MgCl}_2 + 2\text{H}_2\text{O}$
5. $2\text{CuS} + 3\text{O}_2 \rightarrow 2\text{CuO} + 2\text{SO}_2$
6. $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$
7. $5\text{Fe}^{2+} + \text{MnO}_4^- + 8\text{H}^+ \rightarrow 5\text{Fe}^{3+} + \text{Mn}^{2+} + 4\text{H}_2\text{O}$
8. $\text{Fe} + \frac{1}{2}\text{O}_2 + \text{H}_2\text{O} \rightarrow \text{Fe}^{2+} + 2\text{OH}^-$

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1. H oxidised $0 \rightarrow +1$ Cl reduced $0 \rightarrow -1$
2. Zn oxidised $0 \rightarrow +2$ Cu reduced $+2 \rightarrow 0$
3. C oxidised $+2 \rightarrow +4$ H reduced $+1 \rightarrow 0$
4. No change
5. S oxidised $-2 \rightarrow +4$ O reduced $0 \rightarrow -2$
6. No change
7. Fe oxidised $+2 \rightarrow +3$ Mn reduced $+7 \rightarrow +2$
8. Fe oxidised $0 \rightarrow +2$ O reduced $0 \rightarrow -2$