

Answers

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Test yourself 1A

- 1 Oxidation is a loss of electrons; reduction is a gain of electrons. 3
- 2 a +1 b +6 c +4 d +4 e -2 4
- 3 a Not redox
b Redox: Cl oxidised, N reduced
c Not redox
d Redox: C oxidised, Fe reduced
e Redox: Mn reduced, S oxidised
- 4 a Oxidising agent = CuO, reducing agent = H₂
b Oxidising agent = Ag⁺, reducing agent = Fe²⁺
c Oxidising agent = IO₃⁻, reducing agent = I⁻

Test yourself 1B

- 1 a Goes from orange to green/blue.
b Goes from colourless to orange/brown.
c Goes from colourless to dark brown.
d Colourless liquid gives off a colourless gas.
- 2 a The blue/black solution will go colourless.
b The pink/purple solution will go colourless; a colourless gas may be seen. 5
c The grey solid starts to disappear, and a colourless gas is given off.

Test yourself 1C

- 1 $2\text{S}_2\text{O}_3^{2-} \longrightarrow \text{S}_4\text{O}_6^{2-} + 2\text{e}^-$
 $\text{I}_2 + 2\text{e}^- \longrightarrow 2\text{I}^-$
 $2\text{S}_2\text{O}_3^{2-} + \text{I}_2 \longrightarrow \text{S}_4\text{O}_6^{2-} + 2\text{I}^-$ 6
- 2 $\text{C}_2\text{O}_4^{2-} \longrightarrow 2\text{CO}_2 + 2\text{e}^- \quad \times 5$
 $\text{MnO}_4^- + 8\text{H}^+ + 5\text{e}^- \longrightarrow \text{Mn}^{2+} + 4\text{H}_2\text{O} \quad \times 2$
 $2\text{MnO}_4^- + 16\text{H}^+ + 5\text{C}_2\text{O}_4^{2-} \longrightarrow 2\text{Mn}^{2+} + 10\text{CO}_2 + 8\text{H}_2\text{O}$
- 3 $\text{BrO}_3^- + 6\text{H}^+ + 6\text{e}^- \longrightarrow \text{Br}^- + 3\text{H}_2\text{O}$
 $2\text{I}^- \longrightarrow \text{I}_2 + 2\text{e}^- \quad \times 3$
 $\text{BrO}_3^- + 6\text{I}^- + 6\text{H}^+ \longrightarrow \text{Br}^- + 3\text{I}_2 + 3\text{H}_2\text{O}$
- 4 $\text{TeO}_3^{2-} + 3\text{H}_2\text{O} + 4\text{e}^- \longrightarrow \text{Te} + 6\text{OH}^-$
 $\text{V}^{4+} \longrightarrow \text{V}^{5+} + \text{e}^- \quad \times 4$
 $\text{TeO}_3^{2-} + 4\text{V}^{4+} + 3\text{H}_2\text{O} \longrightarrow \text{Te} + 4\text{V}^{5+} + 6\text{OH}^-$ Te