

Exercise walk-through

5.2.2

Separate precipitation, ligand exchange and acid–base changes

Pearson Edexcel · International A-Level · Chemistry

Choose a cell voltage

Your turn

Reduction potentials are $+0.80\text{ V}$ and $+0.34\text{ V}$. What is spontaneous E°_{cell} ?

- A. $+1.14\text{ V}$
- B. $+0.46\text{ V}$
- C. -0.46 V

Find oxidation state and coordination

Your turn

$[\text{Cr}(\text{H}_2\text{O})_4\text{Cl}_2]^+$ has which chromium state and coordination number?

- A. +1 and 4
- B. +3 and 6
- C. +3 and 2

Aspirin transfer calculation

Your turn

2.76 g salicylic acid, $M=138$, gives aspirin $M=180$ in 1:1 ratio. Dry mass is 2.52 g. What is yield?

- A. 50.0%
- B. 70.0%
- C. 91.3%

Exercises 2.1·2.3

2.1 State the initial Fe^{2+} and Fe^{3+} hydroxide precipitate colours. Give a change that

2.2 Compare zinc and copper with a small amount and then excess ammonia. [4]

2.3 Write the ionic equation for $\text{Zn}(\text{OH})_2$ dissolving in excess hydroxide to $[\text{Zn}(\text{OH})_4]^{2-}$. [2]

Exercises 2.1·2.3

2.1 State the initial Fe^{2+} and Fe^{3+} hydroxide precipitate colours. Give a change that

2.1 Fe^{2+} : green; Fe^{3+} : red-brown. Fe^{2+} hydroxide oxidises and turns brown in air.

2.2 Compare zinc and copper with a small amount and then excess ammonia. [4]

2.2 Zinc gives a white precipitate, dissolving to a colourless solution in excess. Copper gives pale blue precipitate, dissolving to deep blue solution in excess.

2.3 Write the ionic equation for $\text{Zn}(\text{OH})_2$ dissolving in excess hydroxide to $[\text{Zn}(\text{OH})_4]^{2-}$. [2]

2.3 $\text{Zn}(\text{OH})_2(\text{s}) + 2\text{OH}^- \rightarrow [\text{Zn}(\text{OH})_4]^{2-}$. Correct species, coefficients/charge.

Exercises 3.1·3.3

3.1 Balance $[\text{Cu}(\text{H}_2\text{O})_6]^{2+} + \text{NH}_3 \rightarrow \text{Cu}(\text{H}_2\text{O})_4(\text{OH})_2 + \text{NH}_4^+$. Explain ammonia's role

3.2 Pink $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$ is in equilibrium with blue $[\text{CoCl}_4]^{2-}$. Write ligand exchange and

3.3 Acid turns yellow chromate(VI) orange. Give the equation and explain why the change is not redox. Separately state V(V), V(IV), V(III), V(II) colours in acidic solutions.

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3.1 $[\text{Cu}(\text{H}_2\text{O})_6]^{2+} + 2\text{NH}_3 \rightarrow \text{Cu}(\text{H}_2\text{O})_4(\text{OH})_2 + 2\text{NH}_4^+$. NH_3 accepts protons, acting

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3.2 $[\text{Co}(\text{H}_2\text{O})_6]^{2+} + 4\text{Cl}^- \rightleftharpoons [\text{CoCl}_4]^{2-} + 6\text{H}_2\text{O}$. Water favours pink aqueous complex

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3.3 $2\text{CrO}_4^{2-} + 2\text{H}^+ \rightleftharpoons \text{Cr}_2\text{O}_7^{2-} + \text{H}_2\text{O}$. Cr stays +6. V(V) yellow, V(IV) blue, V(III)