B4 · Extra practice

Original diploma-style practice | Items 1-2

Extra practice for this lesson. Original questions, not released diploma items. Select one option for multiple choice; other tasks state the required response.

Use the givens and conditions in each prompt. Enter the requested count, coefficient, oxidation number or potential with the stated unit and precision.

B4-D01 · Multiple choice

In a test, zinc metal turns Cu^{2+} ions into copper metal. Which comparison does this show?

A. Cu > Zn as reducing agents
B. Zn > Cu as reducing agents
C. Zn^{2+} > Cu^{2+} as oxidizing agents
D. Nothing can be compared

Response: _____

B4-D02 · Numerical response

Use these rows from the Data Booklet table of standard electrode potentials: $Ag^{+} + e^{-} \rightarrow Ag$, +0.80 V; $Cu^{2+} + 2e^{-} \rightarrow Cu$, +0.34 V; $Zn^{2+} + 2e^{-} \rightarrow Zn$, -0.76 V. The conditions are standard: 25 °C and 1.0 mol/L solutions. Calculate E° for $Cu + 2Ag^{+} \rightarrow Cu^{2+} + 2Ag$. Enter the value in volts, with its sign, to two decimal places.

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 3-4

B4-D03 · Numerical response

Use these rows from the Data Booklet table of standard electrode potentials: $Ag^+ + e^- \rightarrow Ag$, +0.80 V; $Cu^{2+} + 2e^- \rightarrow Cu$, +0.34 V; $Zn^{2+} + 2e^- \rightarrow Zn$, -0.76 V. The conditions are standard: 25 °C and 1.0 mol/L solutions. Calculate E° for $Cu + Zn^{2+} \rightarrow Cu^{2+} + Zn$. Enter the value in volts, with its sign, to two decimal places.

Response: _____

B4-D04 · Ordering / ranking

The metals are in the order Zn > Cu > Ag as reducing agents. Put the three metals in order from the strongest to the weakest reducing agent.

Strongest to weakest reducing agent

1. Cu
2. Ag
3. Zn

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 5-6

B4-D05 · Ordering / ranking

The metals are in the order Zn > Cu > Ag as reducing agents. Put their ions in order from the strongest to the weakest oxidizing agent.

Strongest to weakest oxidizing agent

1. Zn^{2+}
2. Ag^{+}
3. Cu^{2+}

Response: _____

B4-D06 · Multiple choice

A beaker contains Cu metal, Ag^{+} ions and nitrate ions. The nitrate ions do not change. Which pair can react in a redox reaction?

A. Zn and Ag^{+}
B. Cu and Ag^{+}
C. Cu^{2+} and Ag
D. Zn^{2+} and Cu^{2+}

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 7-8

B4-D07 · Select all that apply

Select everything that should be kept the same when two tests of a metal in a solution are compared.

A. The concentration of the ion
B. The surface area of the metal
C. The time
D. Which metal and which ion are tested

Response: _____

B4-D08 · Matching

Match each record to what kind of evidence it is.

Items to match:

1. A visible coating forms
2. An equation shows which particle gained electrons
3. A simulation gives the same result every time

Targets:

A. The simulation follows fixed rules; it is not new evidence
B. An observation: something seen
C. An inference about particles

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 9-10

B4-D09 · Numerical response

Use these rows from the Data Booklet table of standard electrode potentials: $Ag^+ + e^- \rightarrow Ag$, +0.80 V; $Cu^{2+} + 2e^- \rightarrow Cu$, +0.34 V; $Zn^{2+} + 2e^- \rightarrow Zn$, -0.76 V. The conditions are standard: 25 °C and 1.0 mol/L solutions. Calculate E° for $Zn + 2Ag^+ \rightarrow Zn^{2+} + 2Ag$. Enter the value in volts to two decimal places.

Response: _____

B4-D10 · Multiple choice

A balanced reaction has a negative E° under standard conditions. Which conclusion is correct?

A. The equation cannot be balanced
B. The reaction must happen instantly
C. The reverse reaction is spontaneous
D. No reaction can ever happen under any conditions

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 11-12

B4-D11 · Multiple choice

Test results, under the same conditions: metal A gives electrons to B^{2+}, and metal B gives electrons to C^{2+}. Which other comparison of reducing agents follows?

A. C > A
B. A > C
C. A = C
D. B > A

Response: _____

B4-D12 · Written response

One short lab test shows no visible change. Give one conclusion that is reasonable. Give one conclusion that this observation alone cannot prove.

Response: _____

B4 · Extra practice

Original diploma-style practice | Items 13-13

B4-D13 · Multiple choice

In the symbol E° for a table value, what does the degree sign ° tell you?

A. The value was measured at 0 °C
B. The value is given at standard conditions
C. The value is an angle between electrodes
D. The value is the same at every concentration

Response: _____