B12 · 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.

B12-D01 · Numerical response

Iron rusts with oxygen in water. What is E°cell, in volts to two decimal places? Use O_2/OH^- +0.40 V and Fe^{2+}/Fe −0.45 V.

Response: _____

B12-D02 · Numerical response

A zinc block is joined to a steel pipe. What is protected minus sacrificial, in volts to two decimal places? Use Zn^{2+}/Zn −0.76 V and Fe^{2+}/Fe −0.45 V.

Response: _____

B12 · Extra practice

Original diploma-style practice | Items 3-4

B12-D03 · Multiple choice

Tin-plated steel is scratched. Which statement is correct? Use Sn^{2+}/Sn −0.14 V and Fe^{2+}/Fe −0.45 V.

A. The tin corrodes
B. The iron corrodes
C. Neither metal corrodes
D. The tin protects the iron

Response: _____

B12-D04 · Multiple choice

To protect a buried pipeline with a power supply, which terminal is the pipeline joined to?

A. The positive terminal
B. The negative terminal
C. Neither terminal
D. Both terminals

Response: _____

B12 · Extra practice

Original diploma-style practice | Items 5-6

B12-D05 · Numerical response

A magnesium block protects a steel tank. What is protected minus sacrificial, in volts to two decimal places? Use Mg^{2+}/Mg −2.37 V and Fe^{2+}/Fe −0.45 V.

Response: _____

B12-D06 · Select all that apply

Select every correct statement about a sacrificial anode.

A. It is below the protected metal on the table
B. It is oxidized and used up
C. It must touch the metal or be wired to it
D. It is the cathode

Response: _____

B12 · Extra practice

Original diploma-style practice | Items 7-8

B12-D07 · Multiple choice

Why is aluminium made from molten aluminium oxide and not from aqueous Al^{3+}?

A. Water is reduced before Al^{3+}, so hydrogen forms
B. Aluminium is too heavy to deposit
C. Water is oxidized at the cathode
D. Al^{3+} is not charged

Response: _____

B12-D08 · Matching

Match each process to its purpose.

Items to match:

1. Electroplating
2. Refining
3. Electrowinning
4. Sacrificial anode

Targets:

A. Recover metal from its ions
B. Coat an object with metal
C. Purify a metal
D. Protect iron by being oxidized

Response: _____

B12 · Extra practice

Original diploma-style practice | Items 9-10

B12-D09 · Multiple choice

In cellular respiration, $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$, which statement is correct?

A. Oxygen is reduced and glucose is the reducing agent
B. Oxygen is oxidized and glucose is the oxidizing agent
C. Carbon is reduced from +4 to 0
D. Nothing is oxidized or reduced

Response: _____

B12-D10 · Numerical response

Nickel is joined to iron. What is protected minus sacrificial for nickel as the sacrificial metal, in volts to two decimal places? Use Ni^{2+}/Ni −0.26 V and Fe^{2+}/Fe −0.45 V.

Response: _____

B12 · Extra practice

Original diploma-style practice | Items 11-12

B12-D11 · Multiple choice

Which statement compares a sacrificial anode with a power supply?

A. Both keep the protected metal as the cathode
B. Both need no maintenance
C. Only the sacrificial anode keeps iron as the cathode
D. Only the power supply is oxidized

Response: _____

B12-D12 · Written response

A company says its coating is better because its cell voltage is higher. Explain what evidence is still needed.

Response: _____