Chemistry · Electrochemistry

Corrosion of Metals

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47	3	21
questions	sets	pages

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Multiple choice questions — 25 questions

1 The metal that corrodes .....

(A) gains electrons.
(B) undergoes a reduction process.
(C) has its oxidation number decreased.
(D) acts as the reducing agent.

2 The following statements are true concerning the corrosion of metals, except .....

(A) The oxidation of most metals is a spontaneous process.
(B) Some metals are covered with a thin layer of their oxides that protects the inner atoms from corrosion.
(C) The rate of rusting of iron in H_2SO_4 solution is greater than in CH_3COOH solution.
(D) Iron found in meteorites in outer space is easily oxidized.

3 Rusting takes place faster when the water causing the rust contains .....

(A) ammonia gas.
(B) sodium chloride salt.
(C) calcium sulphate.
(D) aluminium hydroxide.

4 Iron rusts when it reacts with (1), and iron can be protected from rusting by bringing it into contact with metal (2).
Which of the following is correct?

(A) (1): oxygen only , (2): copper.
(B) (1): oxygen only , (2): magnesium.
(C) (1): oxygen + water vapour , (2): copper.
(D) (1): oxygen + water vapour , (2): magnesium.

5 Iron oxide ores are converted into iron by process (1), and iron rusts by process (2).
Which of the following is correct?

(A) (1): reduction , (2): reduction.
(B) (1): oxidation , (2): reduction.
(C) (1): reduction , (2): oxidation.
(D) (1): oxidation , (2): oxidation.

6 All of the following describe exposing an iron rod containing a percentage of carbon to moist air, except .....

(A) The iron rod acts as both the anode and the external circuit.

(B) Reduction takes place at the carbon.

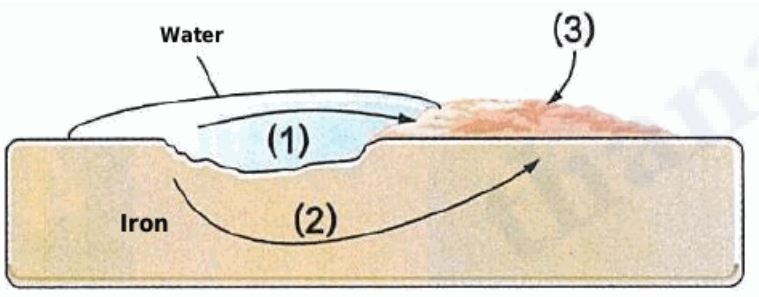
(C) Carbon acts as the cathode.

(D) The percentage of iron increases.

7 The carbon in a steel alloy does not corrode when the alloy rusts, because it acts as the .....

(A) electrolyte. (B) anode. (C) cathode. (D) external circuit.

8 The opposite figure shows the mechanism of the corrosion of iron.
Which of the following is correct?



(A) (1): e^- , (2): $Fe^{2+}(aq)$, (3): O_2

(B) (1): $Fe^{2+}(aq)$, (2): O_2 , (3): e^-

(C) (1): $Fe^{3+}(aq)$, (2): $Fe(OH)_3(s)$, (3): O_2

(D) (1): $Fe^{2+}(aq)$, (2): e^- , (3): $Fe(OH)_3(s)$

9 Which of the following represents the correct order of the chemical processes that take place on the surface of a piece of iron exposed to moist air?

(A) Oxidation – reduction – precipitation – reduction.

(B) Oxidation – reduction – precipitation – oxidation.

(C) Oxidation – oxidation – reduction – precipitation.

(D) Reduction – oxidation – precipitation – oxidation.

10 All of the following are used to distinguish between the rust compound of iron and the hydroxide of the non-transition element used in making the alloy of soft-drink cans, except .....

(A) melting point. (B) NaOH(aq) (C) colour. (D) $H_2O(l)$

11 Which pair of the following reactions is represented by the same chemical equation?

(A) The anode reaction in the fuel cell and the anode reaction in the iron rusting cell.

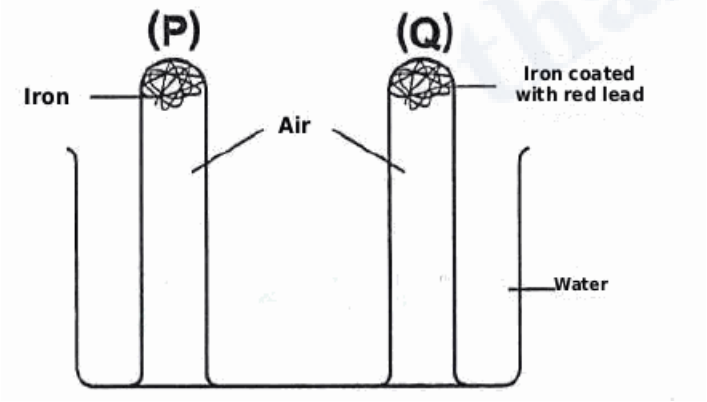
(B) The cathode reaction in the mercury cell and the cathode reaction in the Daniell cell.

(C) The cathode reaction in the fuel cell and the cathode reaction in the iron rusting cell.

(D) The anode reaction in the lead-acid accumulator during discharge and the anode reaction in a galvanic cell whose electrodes are Zn , Pb

12 The opposite figure shows an experiment to show the effect of coating with an inorganic substance such as red lead on the rusting of iron.

What happens, after a period of time, to the water level in each of tubes (P) and (Q), respectively?



(A) Falls , rises. (B) No change , rises.

(C) Rises , no change. (D) No change , falls.

13 From the oxidation potentials shown in the following table:

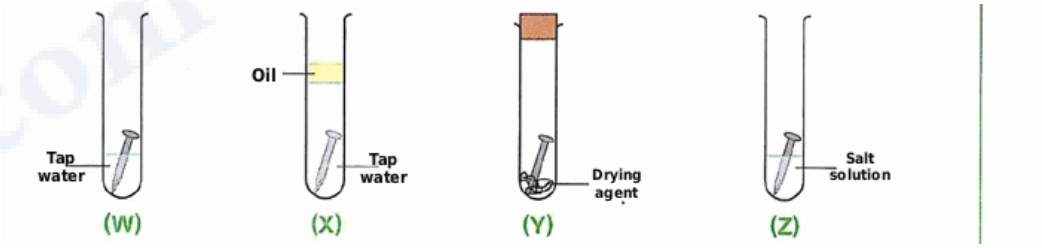
Metal (1): −0.8 V , metal (2): +0.74 V , metal (3): −0.34 V , metal (4): +0.45 V , Pb: +0.13 V

Which of these metals can be used as a cathodic coating for lead?

(A) (1) , (4). (B) (1) , (3). (C) (2) , (3). (D) (2) , (4).

14 The following figures represent four different experiments:

Which of the following represents the order of the rate of rusting of the nail in the four experiments?



(A) Z < Y < X < W (B) W < Y < Z < X (C) W < Z < X < Y (D) Y < X < W < Z

15 Bringing iron into contact with a piece of zinc protects it from rusting, as a result of .....

(A) the transfer of electrons from iron to zinc.

(B) zinc being reduced faster than iron.

(C) the transfer of electrons from zinc to iron.

(D) the reduction of oxygen gas at the zinc.

16 The following statements show a student's understanding of the role of zinc in protecting the surface of iron from rusting:

(1): Zinc acts as an anode and iron as a cathode.

(2): The zinc layer protects iron from moisture and air.

(3): The zinc layer acts as a cathodic coating for iron.

Which of the following represents the role of zinc?

(A) (1) only. (B) (2) only. (C) (1) , (2) only. (D) (1) , (2) , (3).

17 From the following statements:

(1): Iron can be protected from rusting by coating it with tin.

(2): Rusting takes place when water and air are available.

(3): Rust is an alloy of iron and oxygen.

(4): Anodic protection is done by connecting iron to another metal less active than it.

Which of the previous statements are correct?

(A) (1) , (2). (B) (1) , (3). (C) (2) , (4). (D) (3) , (4).

18 All of the following represent the use of a sacrificial electrode to protect a steel tank buried underground, except .....

(A) connecting the tank to a piece of copper.

(B) connecting the tank to a piece of magnesium.

(C) connecting the tank to a piece of calcium.

(D) connecting the tank to a piece of zinc.

---

19 If the oxidation potential of iron Fe equals +0.401 V

then the potential of the metal that can be used as an anodic coating for iron is .....

(A) [E°oxid = 1.29 V]

(B) [E°oxid = −1.5 V]

(C) [E°oxid = 0.13 V]

(D) [E°oxid = − 0.34 V]

---

20 From the opposite standard potentials:

A / A^{2+} : E° = 0.76 V

B^{+} / B : E° = 0.8 V

C / C^{2+} : E° = 0.56 V

Which of the following metals acts as a sacrificial electrode?

(A) Metal (B) relative to metal (A).

(B) Metal (B) relative to metal (C).

(C) Metal (A) relative to metal (C).

(D) Metal (C) relative to metal (A).

---

21 A piece of iron can be protected from rusting by .....

(A) making it a cathode.

(B) placing it in a neutral salt solution.

(C) bringing it into contact with a piece of lead.

(D) bringing it into contact with a piece of gold.

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22 Which of the following increases the rate of rusting of an iron nail immersed in water?

(A) Adding calcium carbonate salt to the water.

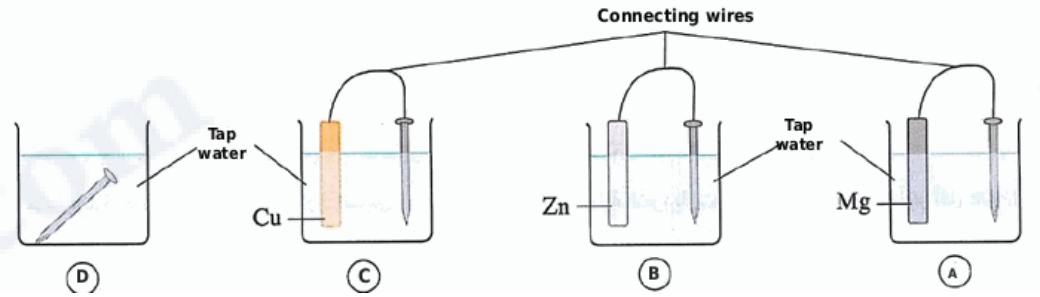
(B) Wrapping the nail with a thin strip of zinc.

(C) Adding potassium nitrate salt to the water.

(D) Connecting the nail to the negative terminal of an electric source.

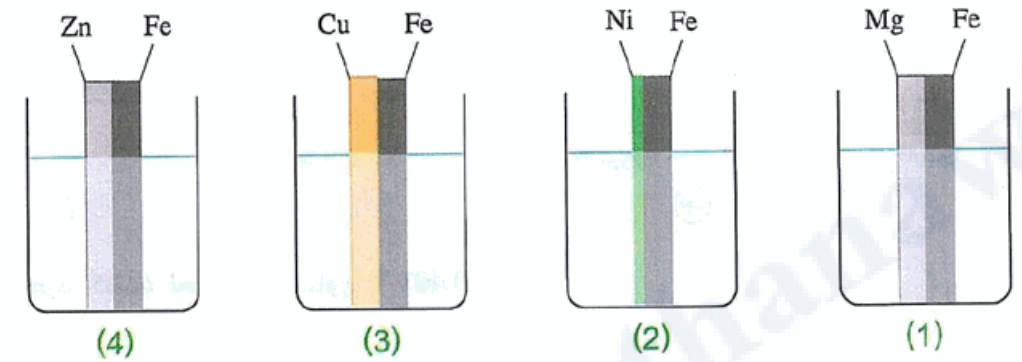
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23 Which of the following represents the case in which the iron nail corrodes at a faster rate?



24 The following figures show four experiments carried out using four identical iron rods placed in water:

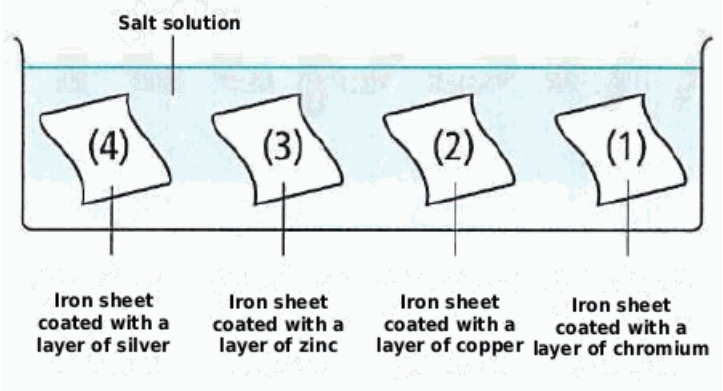
The two experiments in which the iron rod rusts first are .....



Ⓐ (2) , (3). Ⓑ (3) , (4). Ⓒ (1) , (4). Ⓓ (1) , (2).

25 From the opposite figure:

The sheet that rusts faster when it is scratched is .....



Ⓐ (1). Ⓑ (2). Ⓒ (3). Ⓓ (4).

Essay questions — 3 questions

1 When iron rusts, the ion produced from the oxidation process combines with the ion produced from the reduction process, forming compound (X):

(1) Write the equation for the formation of compound (X), stating its colour after being exposed to air.

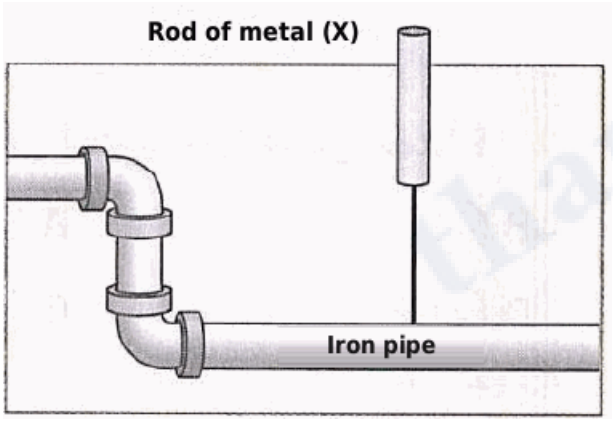
(2) What change takes place in the colour of compound (X) over time? Explain.

---

2 The opposite figure shows an iron pipe being protected from rusting by connecting it to a rod of metal (X):

(1) Does metal (X) replace iron in solutions of its salts? Explain.

(2) What change takes place in the mass of each of the rod and the iron pipe over time? Explain.



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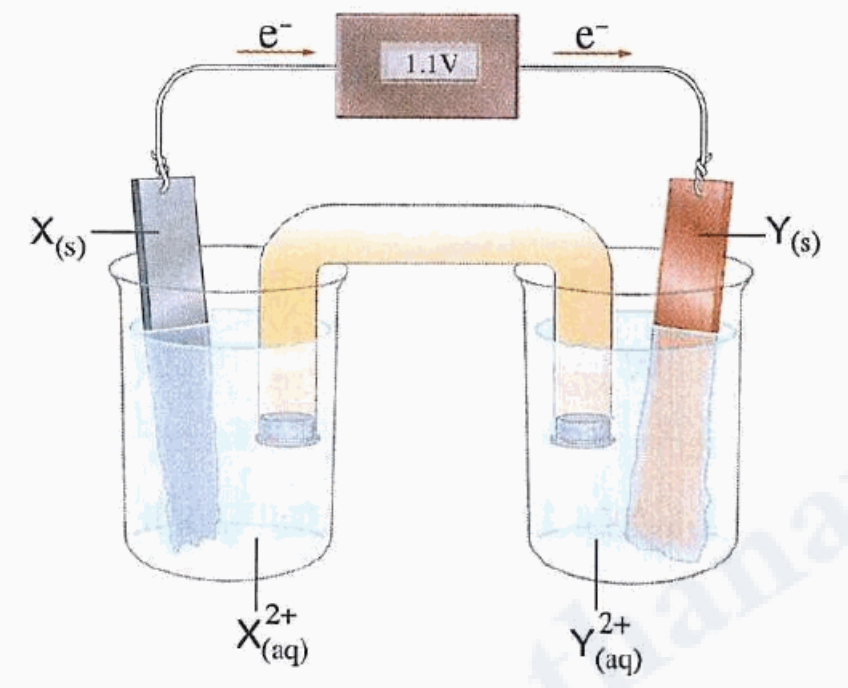
3 From the opposite figure:

(1) Which of the two electrodes (X) or (Y) can be used in galvanizing metals? Explain.

(2) Write the equation of the actual reaction taking place on the surface of each of:

(a) electrode (X).

(b) electrode (Y).



Past exam questions — 19 questions

1 The opposite table represents the standard reduction potentials of metals (A , B , C):
(A): −0.44 V , (B): +0.34 V , (C): +0.8 V
When each of metals (A) and (B) is separately coated with a layer of metal (C),
which of the following represents the correct type of protection?

(A) Anodic protection for (A) and cathodic for (B).
(B) Cathodic protection for (A) and cathodic for (B).
(C) Anodic protection for (A) and anodic for (B).
(D) Cathodic protection for (A) and anodic for (B).

---

2 The opposite table shows four galvanic cells made of hypothetical metals with an iron electrode under standard conditions:
A – Fe: cell potential +1.4 V , direction of electron flow A → Fe
B – Fe: cell potential +1.05 V , direction of electron flow Fe → B
C – Fe: cell potential +0.5 V , direction of electron flow C → Fe
D – Fe: cell potential +1.7 V , direction of electron flow Fe → D
Which of the following metals is preferably used as a sacrificial electrode for iron to protect it from rusting?

---

3 The following table represents the electrode potentials of four metals (X , Y , Z , W):
$X^{2+} / X = 0.34$ V , $Y / Y^{2+} = -1.2$ V , $Z^{2+} / Z = -2.375$ V , $W / W^{2+} = -1.42$ V
[$Zn \rightarrow Zn^{2+} + 2e^{-}$, $E^{\circ} = 0.76$ V]
Which of these metals corrodes fastest when it is in contact with zinc metal?

(A) X (B) Y (C) Z (D) W

---

4 Which of the following examples represents cathodic protection of metals from corrosion?

(A) Painting iron with an inorganic substance such as red lead.
(B) Galvanizing iron by dipping it in zinc.
(C) Coating iron with a metal that has a lower reduction potential than iron.
(D) Coating iron with a metal that has a lower oxidation potential than iron.

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5 The opposite table shows the oxidation potentials of some hypothetical elements:

W: +1.67 V , Z: −1.420 V , Y: −0.401 V , X: +0.126 V

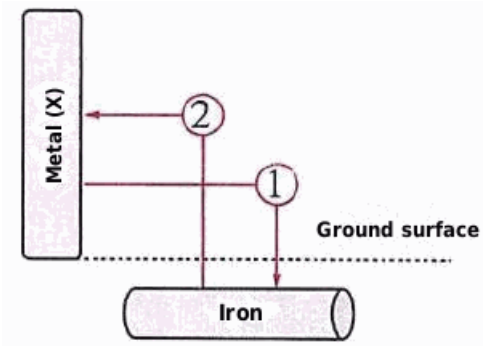
Which of the following represents the correct type of protection?

(A) (X) is anodic protection for (W).
(B) (Z) is anodic protection for (Y).
(C) (W) is cathodic protection for (Y).
(D) (Y) is cathodic protection for (X).

---

6 The opposite figure shows one of the methods of protecting iron pipes buried in the ground from rusting.

Which of the following represents metal (X)?



(A) (X): does not replace hydrogen ions in acids, so the direction of electrons is number (2).
(B) (X): reduces iron ions in their solution, so the direction of electrons is (1).
(C) (X): its ions are reduced by iron atoms, so the direction of electrons is (1).
(D) (X): its oxidation potential is higher than iron, so the direction of electrons is (2).

---

7 The opposite table shows the reduction potentials of some elements.

(A): −0.45 V , (B): −1.7 V , (C): −2.87 V , (D): −2.52 V

Which of the following elements can be used as a sacrificial electrode for element (B)?

(A) (A) only.
(B) (D) only.
(C) (C) , (A).
(D) (C) , (D).

---

8 The figure in front of you shows a water tank connected to a pipe and a tap made of three metals (X , Y , Z),

whose reduction potentials are as follows: (X = −0.40 V , Y = +0.3 V , Z = −2.71 V)

The pipe acts as a sacrificial electrode for both the tank and the tap, and the material the tap is made of represents cathodic protection for the tank under normal conditions.

Which of the following choices represents the metals that each of them is made of?

(A) Tank: (Y) , tap: (X) , pipe: (Z)
(B) Tank: (X) , tap: (Y) , pipe: (Z)
(C) Tank: (X) , tap: (Z) , pipe: (Y)
(D) Tank: (Z) , tap: (Y) , pipe: (X)

9 The following table shows the potentials of some elements:

$A \rightarrow A^{2+} : E^\circ = -1.2\ V$

$B \rightarrow B^{2+} : E^\circ = -2.87\ V$

$C^{2+} \rightarrow C : E^\circ = -1.2\ V$

$D^{2+} \rightarrow D : E^\circ = -0.12\ V$

Which of the following choices is correct?

(A) Element (A) represents cathodic protection for element (B).

(B) Element (B) represents a sacrificial electrode for element (D).

(C) Element (C) represents anodic protection for element (A).

(D) Element (D) represents a sacrificial electrode for element (C).

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10 The electrolyte that leads to faster corrosion of metals is .....

(A) H_2SO_4 (0.5 M) (B) HCl (0.5 M) (C) HNO_2 (1 M) (D) H_2SO_3 (1 M)

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11 The following table shows the electrode potentials of several metals:

Reduction potential: Fe = −0.409 V , (X) = −2.375 V , (Y) = −1.67 V , (Z) = −0.23 V

You have four pieces of iron: part of the first was coated with (X), part of the second was coated with (Y), part of the third was coated with (Z), and the fourth was left uncoated. The piece that rusts fastest is the .....

(A) first. (B) third. (C) fourth. (D) second.

---

12 From the opposite equation: $Ba(s) + Cr^{2+}(aq) \rightarrow Ba^{2+}(aq) + Cr(s)$

Which of the following choices is correct for protecting each of the two metals from corrosion?

(A) Coating barium with chromium, a cathodic coating.

(B) Coating barium with chromium, an anodic coating.

(C) Coating chromium with barium, a cathodic coating.

(D) Coating chromium with barium, an anodic coating.

---

13 If you know that the oxidation potential of element (X) = + 0.409 V, then the element that can be used as cathodic protection for element (X) is .....

(A) an element whose standard reduction potential = − 0.76 V

(B) an element whose standard oxidation potential = + 1.03 V

(C) an element whose standard reduction potential = − 0.136 V

(D) an element whose standard oxidation potential = + 0.74 V

---

14 A piece of element (X) was coated with a layer of element (Y). If you know that the standard reduction potential of element (X) = −0.409 V and the standard reduction potential of element (Y) = −2.375 V,

which of the following represents this process correctly?

(A) Anodic protection, and reduction of the ions of element (X) takes place.

(B) Anodic protection, and reduction of the oxygen of moist air takes place.

(C) Cathodic protection, and reduction of the oxygen of moist air takes place.

(D) Cathodic protection, and reduction of the ions of element (X) takes place.

---

15 The following table shows the standard reduction potentials of elements (Z) , (Y) , (X) , (W):

(Z): −1.66 V , (Y): −0.74 V , (X): −0.25 V , (W): −2.37 V

Which of the following represents anodic protection?

(A) Element (Y) is coated with element (Z).

(B) Element (Y) is coated with element (X).

(C) Element (W) is coated with element (Z).

(D) Element (W) is coated with element (X).

---

16 The following table represents four reduction potentials of four elements (A) , (B) , (C) , (D), respectively:

(A): −1.66 V , (B): −2.37 V , (C): +0.799 V , (D): −1.26 V

Which of the previous elements can be used as a sacrificial element relative to another element?

(A) C relative to A (B) C relative to D (C) B relative to A (D) A relative to B

---

17 The standard reduction potentials of elements (X) , (Y) , (Z) are as in the table:

(X): −0.28 V , (Y): +1.2 V , (Z): −1.029 V

Which of the following coatings makes the coated metal corrode fastest when scratched?

(A) Coating element (X) with element (Z).

(B) Coating element (Z) with element (Y).

(C) Coating element (Y) with element (X).

(D) Coating element (X) with element (Y).

---

18 The following table represents the oxidation potentials of elements (X) , (Y) , (Z):

(X): 0.3 V , (Y): 2.3 V , (Z): 0.7 V

When each of elements (X) and (Y) is separately coated with element (Z), which of the following represents the correct protection?

(A) Cathodic protection for (X) and anodic protection for (Y).

(B) Anodic protection for (X) and cathodic protection for (Y).

(C) Anodic protection for (X) and anodic protection for (Y).

(D) Cathodic protection for (X) and cathodic protection for (Y).

---

19 To protect element (A) by element (B) from corrosion, there takes place .....

(A) withdrawal of electrons from (A) to (B), and it represents anodic protection.

(B) withdrawal of electrons from (B) to (A), and it represents anodic protection.

(C) transfer of electrons to (A), and it represents cathodic protection.

(D) transfer of electrons between (A) , (B), and (A) represents a sacrificial electrode.

Answer key and solutions

Multiple choice questions

1 D	2 D	3 B	4 D	5 C	6 D	7 C	8 D	9 B	10 D
11 C	12 C	13 B	14 D	15 C	16 C	17 A	18 A	19 A	20 C
21 A	22 C	23 C	24 A	25 D					

1 **Answer (D)**

The metal that corrodes is oxidized: it loses electrons and its oxidation number increases.

So it acts as the reducing agent.

2 **Answer (D)**

Iron rusts in the presence of oxygen and water, and these are not present in outer space.

So the iron found in meteorites is not easily oxidized.

3 **Answer (B)**

Dissolved salts such as sodium chloride increase the electrical conductivity of water, so they increase the rate of rusting.

4 **Answer (D)**

Iron rusts by reacting with oxygen and water vapour.

Magnesium is more active than iron, so it acts as a sacrificial electrode and protects it, while copper is less active.

5 **Answer (C)**

Converting iron oxide into iron is reduction.

The rusting of iron is oxidation because Fe loses electrons.

6 **Answer (D)**

Iron is oxidized (anode) and transfers the electrons (external circuit).

Carbon is the cathode, and oxygen is reduced at it.

So the percentage of iron decreases and does not increase.

7 **Answer (C)**

Carbon is less active than iron, so it is not oxidized.

It acts as the cathode.

8 **Answer (D)**

(1) Fe^{2+} ions form at the anode.

(2) The movement of electrons through the iron.

(3) Rust $Fe(OH)_3$ is deposited.

9 **Answer (B)**

Oxidation: $Fe \rightarrow Fe^{2+}$

Reduction: $O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$

Precipitation: $Fe(OH)_2$

Oxidation: $Fe(OH)_2 \rightarrow Fe(OH)_3$

10 **Answer (D)**

Both compounds are solids that do not dissolve in water.

So water does not distinguish between them, while colour, melting point and NaOH distinguish between them.

11 **Answer (C)**

At the cathode of both cells, oxygen is reduced.

$O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$

12 **Answer (C)**

Tube (P): the iron rusts and consumes the oxygen of the air, so the water rises.

Tube (Q): the iron is coated with red lead, so it does not rust and the water level does not change.

13 **Answer (B)**

A cathodic coating is a metal less active than lead.

The oxidation potential of Pb = +0.13 V, so an oxidation potential lower than +0.13 V is needed.

This applies to (1) and (3).

14 **Answer (D)**

Salt water speeds up rusting (Z), then water (W).

Oil reduces the access of oxygen (X), and the drying agent prevents rusting (Y).

So the order is Y < X < W < Z

15 **Answer (C)**

Zinc is more active than iron, so it is oxidized instead of it.

Electrons transfer from zinc to iron, so it protects it.

16 **Answer (C)**

(1) is correct: zinc is the anode and iron is the cathode.

(2) is correct: the layer prevents moisture and air from reaching the iron.

(3) is wrong: zinc is an anodic coating, not a cathodic one.

17 **Answer (A)**

(1) and (2) are correct.

(3) is wrong: rust is a hydrated iron oxide.

(4) is wrong: the metal used in anodic protection is more active than iron.

18 **Answer (A)**

A sacrificial electrode is a metal more active than iron.

Copper is less active than iron, so it is not suitable.

19 **Answer (A)**

An anodic coating is a metal more active than iron.

That is, its oxidation potential is greater than +0.401 V, which is +1.29 V

20 **Answer (C)**

The sacrificial electrode is the metal with the higher oxidation potential.

The oxidation potential of A = 0.76 V is greater than the oxidation potential of C = 0.56 V.

(B^+ / B is a reduction potential, so the oxidation potential of B = −0.8 V, which is the lowest.)

21 **Answer (A)**

When iron becomes a cathode, it is not oxidized.

22 **Answer (C)**

Dissolved salts such as potassium nitrate increase the conductivity of water, so they increase rusting.

Wrapping the nail with zinc and connecting it to the negative terminal protect it.

23 **Answer (C)**

Copper is less active than iron, so iron acts as an anode and corrodes faster.

Magnesium and zinc are more active than iron, so they protect it.

24 **Answer (A)**

Nickel and copper are less active than iron.

So iron acts as an anode and rusts first in experiments (2) and (3).

25 **Answer (D)**

Silver is less active than iron.

So the iron corrodes faster when it is scratched.

Essay questions

1 **Model answer**

(1) $Fe^{2+}(aq) + 2OH^{-}(aq) \rightarrow Fe(OH)_2(s)$

Its colour is greenish white.

(2) The colour of compound (X) changes over time to reddish brown, as it is oxidized to $Fe(OH)_3$

2 **Model answer**

(1) Metal (X) replaces iron in solutions of its salts, because in anodic protection iron is connected to a sacrificial metal more active than it.

(2) The mass of rod (X) decreases over time as it corrodes instead of the iron pipe, whose mass does not change.

3 **Model answer**

(1) Electrode (X), because the voltmeter reading indicates that the figure represents a Daniell cell, in which zinc acts as the anode from which electrons move through the external wire circuit.

(2) (a) $Zn(s) \rightarrow Zn^{2+}(aq) + 2e^{-}$

(b) $Cu^{2+}(aq) + 2e^{-} \rightarrow Cu(s)$

Past exam questions

1	2	3	4	5	6	7	8	9	10
B	A	C	D	D	B	D	B	C	A
11	12	13	14	15	16	17	18	19	
B	A	C	B	A	C	B	B	B	

1 **Answer (B)**

(C) has a higher reduction potential than (A) and (B), i.e. it is less active than both.

So it represents cathodic protection for each of them.

2 **Answer (A)**

The sacrificial metal is the anode, so electrons move from it to the iron.

Electrons move from A and C to Fe, and A is the best because its emf is greater (1.4 V).

3 **Answer (C)**

The oxidation potential of Z = +2.375 V, which is greater than the oxidation potential of Zn = 0.76 V.

So Z is the anode and corrodes faster.

4 **Answer (D)**

Cathodic protection is by a coating of a less active metal (with a lower oxidation potential).

Galvanizing and a coating of a more active metal are anodic protection.

5 **Answer (D)**

Cathodic protection: the coated metal is more active than the coating.

The oxidation potential of Y (−0.401) is lower than that of X (+0.126).

So (Y) is cathodic protection for (X).

6 **Answer (B)**

(X) is a sacrificial electrode more active than iron.

It reduces iron ions in their solution, so electrons move from (X) to the iron (1).

7 **Answer (D)**

The sacrificial electrode is more active than (B), i.e. its reduction potential is lower than −1.7 V.

These are (C) and (D).

8 **Answer (B)**

The pipe is the sacrificial electrode (Z) because it has the lowest reduction potential (−2.71 V).

The tap is cathodic protection for the tank, so it is less active (Y).

The tank is (X).

9 **Answer (C)**

$C^{2+} \rightarrow C$ has a reduction potential of −1.2 V, so the oxidation potential of C = +1.2 V.

The oxidation potential of A = −1.2 V.

So element (C) is more active than (A) and represents anodic protection.

10 **Answer (A)**

H_2SO_4 (0.5 M) is a strong dibasic acid.

The H^+ concentration = 1 M, which is the highest.

The other acids are weaker or less concentrated.

11 **Answer (B)**

The reduction potential of (Z) is higher than that of iron, so it is less active.

So iron acts as an anode and rusts faster, which is the third piece.

12 **Answer (A)**

Oxidation potential: Ba is greater than Cr because the reaction is spontaneous.

So barium is more active, and coating it with chromium is cathodic protection.

13 **Answer (C)**

Cathodic protection is by a metal less active than (X).

Its oxidation potential is lower than +0.409 V.

A reduction potential of −0.136 V means an oxidation potential of +0.136 V.

14 **Answer (B)**

The reduction potential of (Y) is lower than that of (X), so it is more active.

So the protection is anodic, and the oxygen of moist air is reduced at the cathode.

15 **Answer (A)**

Anodic protection is by a more active metal (lower reduction potential).

(Z) is more active than (Y).

16 **Answer (C)**

The sacrificial electrode is the more active one, i.e. the one with the lower reduction potential.

(B) is more active than (A).

17 **Answer (B)**

The fastest corrosion on scratching is for the more active metal coated with a much less active metal.

(Z) coated with (Y).

18 **Answer (B)**

The oxidation potential of (Z) is higher than that of (X), so it is anodic protection for (X).

And lower than that of (Y), so it is cathodic protection for (Y).

19 **Answer (B)**

The sacrificial element (B) is more active and loses electrons.

Electrons move from (B) to (A), and it represents anodic protection.