EdLoop JEE

CHEMISTRY · JEE MAIN

General Principles of Metallurgy

Previous Year Questions with answers

124 questions · **116** papers · **2002–2023** · newest paper first

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What is in this PDF: every General Principles of Metallurgy question we hold from past JEE Main and AIEEE papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

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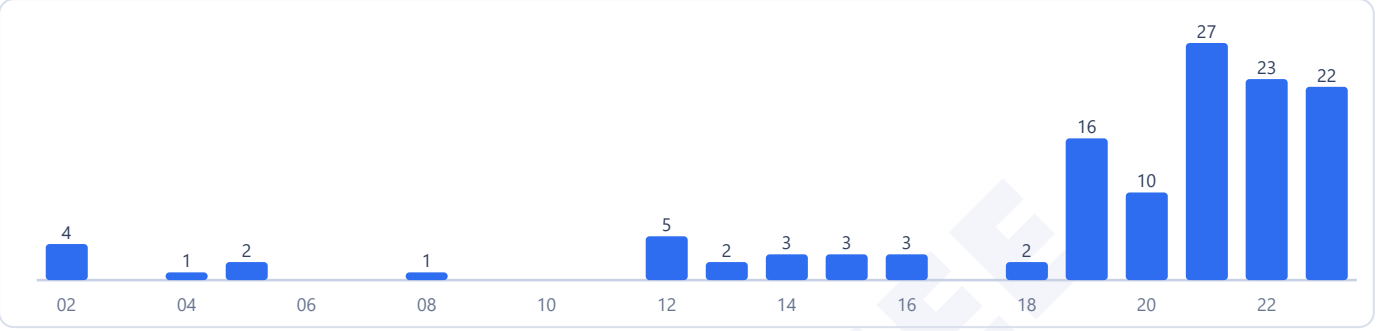
Chapter at a glance

2.1%	124	94 of 162	120 / 4
of Chemistry questions, 2019–2026	questions, 2002–2023	papers asked it, 2019–2026	MCQ / numerical, 2002–2023

Trend. Steady: 1 questions per paper in 2021–2023 against 0.8 in 2019–2020.

Questions per year



Counts are the questions we hold: 124 in 116 papers. No question in this chapter was found repeated across papers.

Most-asked topics in this chapter (2002–2023)

Extraction of Metals — **124**

How often it comes up

General principles of metallurgy covers the chemical extraction of metals and was formerly in the Class 12 curriculum before being removed in 2024, standing at rank 25 of 31 chapters with a 2.1% share of the chemistry section. In the 2019 to 2026 test series, General Principles of Metallurgy yielded 98 questions across 162 exam papers, accounting for 2.1% of the chemistry section and standing at rank 25 of 31 chapters. During the 2002 to 2018 period, it produced 26 questions across 38 papers with a 1.9% share. Across the 2024 to 2026 seasons, it recorded 0 questions across 58 papers, resulting in a 0.0% share. The chapter's appearance frequency has trended down following curriculum deletion.

Due to its removal, the chapter was not asked in 2024, 2025, or 2026. Across the 2019 to 2026 span, it averaged 0.6 questions per paper, with only 4 numerical answer questions recorded.

Most-asked topics

Historic test items fall under one comprehensive topic:

- Extraction of Metals: Composed 124 total questions (98 during 2019 to 2026), last tested in 2023. Core themes focused on mineral matching (such as sphalerite, calamine, malachite, and bauxite), concentration by froth flotation and leaching, Ellingham diagram Gibbs free energy curves, metallurgy of copper (matte formation and blister copper), blast furnace reduction of hematite, Hall-Héroult process for aluminum, and refining via Mond process and van Arkel method.

What the questions look like

Previous exam questions were largely descriptive and factual. Common problems asked candidates to match mineral names with their chemical formulas, identify the role of depressants like sodium cyanide in separating galena from zinc blende, or explain why Ellingham curves exhibit a positive slope as temperature rises.

Refining methods appeared very frequently, testing which pure metals correspond to specific techniques such as zone refining for semiconductors (silicon and germanium), Mond process for nickel, or van Arkel method for

zirconium and titanium.

How to practise it

Because metallurgy has been dropped from the active syllabus, optimize your study plan accordingly:

1. Dedicate time to current inorganic units: Concentrate your preparation hours on active syllabus topics such as Coordination Compounds and d- and f-Block Elements. 2. Maintain basic mineral formula recall: Knowing common ore names like bauxite, hematite, and copper pyrites occasionally supports practical chemistry questions. 3. Understand Ellingham fundamentals: Grasping that lower lines on free energy plots reduce metal oxides located higher up reinforces core thermodynamic principles.

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Q1 JEE Main 2023 · 15 Apr · Shift 1 MCQ

Which one of the following is not an example of calcination?

(A) $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$

(B) $Fe_2O_3.xH_2O \xrightarrow{\Delta} Fe_2O_3 + xH_2O$

(C) $2PbS + 3O_2 \xrightarrow{\Delta} 2PbO + 2SO_2$

(D) $CaCO_3.MgCO_3 \xrightarrow{\Delta} CaO + MgO + 2CO_2$

Answer: (C) $2PbS + 3O_2 \xrightarrow{\Delta} 2PbO + 2SO_2$ · Key from source paper

Q2 JEE Main 2023 · 13 Apr · Shift 1 MCQ

Which one of the following is most likely a mismatch?

(A) Zinc-Liquation

(B) Copper-Electrolysis

(C) Nickel-Mond process

(D) Titanium-van Arkel Method

Answer: (A) Zinc-Liquation · Key from source paper

Q3 JEE Main 2023 · 13 Apr · Shift 2 MCQ

Given below are two statements related to Ellingham diagram :
Statement I : Ellingham diagrams can be constructed for formation of oxides, sulphides and halides of metals.
Statement II : It consists of plots of ΔH° vs T for formation of oxides of elements.
In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both Statement I and Statement II are correct

(B) Both Statement I and Statement II are incorrect

(C) Statement I is correct but Statement II is incorrect

(D) Statement I is incorrect but Statement II is correct

Answer: (C) Statement I is correct but Statement II is incorrect · Key from source paper

Q4 JEE Main 2023 · 12 Apr · Shift 1 MCQ

Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R
Assertion A: In the Ellingham diagram, a sharp change in slope of the line is observed from Mg $\rightarrow$ MgO at ~1120°C
Reason R: There is a large change of entropy associated with the change of state
In the light of the above statements, choose the correct answer from the options given below

(A) Both A and R are true but R is NOT the correct explanation of A
(B) A is false but R is true
(C) Both A and R are true and R is the correct explanation of A
(D) A is true but R is false

Answer: (C) Both A and R are true and R is the correct explanation of A · Key from source paper

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Q5 JEE Main 2023 · 11 Apr · Shift 1 MCQ

In the extraction process of copper, the product obtained after carrying out the reactions
(i) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
(ii) $2Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$ is called

(A) Blister copper
(B) Reduced copper
(C) Copper scrap
(D) Copper matte

Answer: (A) Blister copper · Key from source paper

Q6 JEE Main 2023 · 11 Apr · Shift 2 MCQ

Given below are two statements:
Statement I: In the metallurgy process, sulphide ore is converted to oxide before reduction.
Statement II: Oxide ores in general are easier to reduce.
In the light of the above statements, choose the most appropriate answer from the options given below:

(A) **Statement I** is correct but **Statement II** is incorrect
(B) Both **Statement I** and **Statement II** are incorrect
(C) **Statement I** is incorrect but **Statement II** is correct
(D) Both **Statement I** and **Statement II** are correct

Answer: (D) Both Statement I and Statement II are correct · Key from source paper

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Q7 JEE Main 2023 · 10 Apr · Shift 1 MCQ

Which of the following is used as a stabilizer during the concentration of sulphide ores?

(A) Pine oils
(B) Fatty acids
(C) Xanthates
(D) Cresols

Answer: (D) Cresols · Key from source paper

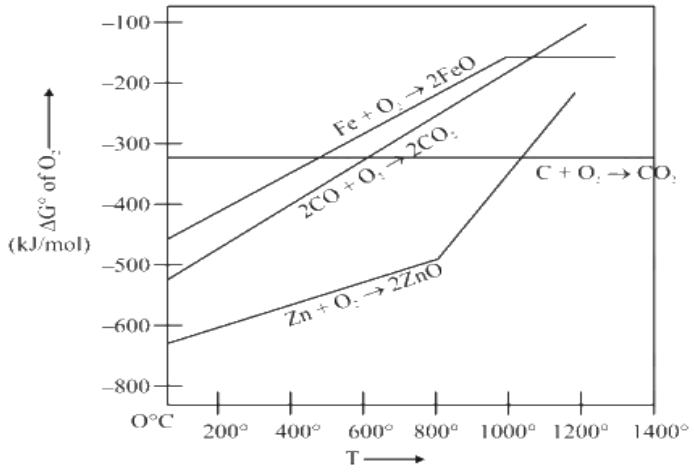
Q8 JEE Main 2023 · 10 Apr · Shift 2 MCQ

Gibbs energy vs T plot for the formation of oxides is given below.

(see the figure above)

For the given diagram, the correct statement is-

Q35. Gibbs energy vs T plot for the formation of oxides is given below.



For the given diagram, the correct statement is-

(1) At 600°C, CO cannot reduce FeO
(2) At 600°C, CO can reduce ZnO
(3) At 600°C, C can reduce ZnO
(4) At 600°C, C can reduce FeO

(A) At $600^{\circ}C$, CO cannot reduce FeO
(B) At $600^{\circ}C$, CO can reduce ZnO
(C) At $600^{\circ}C$, C can reduce ZnO
(D) At $600^{\circ}C$, C can reduce FeO

Answer: (D) At $600^{\circ}C$, C can reduce FeO · Key from source paper

Q9 JEE Main 2023 · 8 Apr · Shift 1 MCQ

Which of the following metals can be extracted through alkali leaching technique?

(A) Sn
(B) Pb
(C) Au
(D) Cu

Answer: (A) Sn · Key from source paper

Q10 JEE Main 2023 · 8 Apr · Shift 2 MCQ

In Hall-Heroult process, the following is used for reducing Al_2O_3 :-

(A) Magnesium
(B) Na_3AlF_6
(C) Graphite
(D) CaF_2

Answer: (C) Graphite · Key from source paper

Q11 JEE Main 2023 · 1 Feb · Shift 1 MCQ

Given below are two statements: one is labelled as **Assertion A** and the other is labelled as **Reason** R
Assertion A: In an Ellingham diagram, the oxidation of carbon to carbon monoxide shows a negative slope with respect to temperature.
Reason R: CO tends to get decomposed at higher temperature.
In the light of the above statements, choose the correct answer from the options given below

(A) Both A and R are correct and R is the correct explanation of A
(B) A is not correct but R is correct
(C) Both A and R are correct but R is NOT the correct explanation of A
(D) A is correct but R is not correct

Answer: (D) A is correct but R is not correct · Key from source paper

Q12 JEE Main 2023 · 1 Feb · Shift 2 Numerical

Among following compounds, the number of those present in copper matte is
A. $CuCO_3$
B. Cu_2S
C. Cu_2O
D. FeO

Numerical value type: the answer is a number.

Answer: 1. · Key from source paper

Q13 JEE Main 2023 · 31 Jan · Shift 1 MCQ

The methods NOT involved in concentration of ore are
(A) Liquation
(B) Leaching
(C) Electrolysis
(D) Hydraulic washing
(E) Froth floatation
Choose the correct answer from the options given below:

(A) B, D and C only
(B) C, D and E only
(C) A and C only
(D) B, D and E only

Answer: (C) A and C only · Key from source paper

Q14 JEE Main 2023 · 31 Jan · Shift 2 MCQ

Which one of the following statements is incorrect ?

(A) van Arkel method is used to purify tungsten.
(B) The malleable iron is prepared from cast iron by oxidising impurities in a reverberatory furnace.
(C) Cast iron is obtained by melting pig iron with scrap iron and coke using hot air blast.
(D) Boron and Indium can be purified by zone refining method.

Answer: (A) van Arkel method is used to purify tungsten. · Key from source paper

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Q15 JEE Main 2023 · 30 Jan · Shift 1 MCQ

In the extraction of copper, its sulphide ore is heated in a reverberatory furnace after mixing with silica to:

(A) separate CuO as $\mathrm{CuSiO_3}$
(B) remove calcium as $\mathrm{CaSiO_3}$
(C) decrease the temperature needed for roasting of $\mathrm{Cu_2S}$
(D) remove FeO as $\mathrm{FeSiO_3}$

Answer: (D) remove FeO as $\mathrm{FeSiO_3}$ · Key from source paper

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Q16 JEE Main 2023 · 30 Jan · Shift 2 MCQ

Given below are two statements:
Statement I: During Electrolytic refining, the pure metal is made to act as anode and its impure metallic form is used as cathode.
Statement II: During the Hall-Heroult electrolysis process, purified $\mathrm{Al_2\,O_3}$ is mixed with $\mathrm{Na_3\,AlF_6}$ to lower the melting point of the mixture.
In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Statement I is incorrect but Statement II is correct
(B) Both Statement I and Statement II are incorrect
(C) Statement I is correct but Statement II is incorrect
(D) Both Statement I and Statement II are correct

Answer: (A) Statement I is incorrect but Statement II is correct · Key from source paper

Q17 JEE Main 2023 · 29 Jan · Shift 1 MCQ

The reaction representing the Mond process for metal refining is _____

(A) $\mathrm{Ni} + 4\mathrm{CO} \xrightarrow{\Delta} \mathrm{Ni(CO)_4}$

(B) $2\mathrm{K[Au(CN)_2]} + \mathrm{Zn} \xrightarrow{\Delta} \mathrm{K_2[Zn(CN)_4]} + 2\,\mathrm{Au}$

(C) $\mathrm{Zr} + 2\mathrm{I_2} \xrightarrow{\Delta} \mathrm{ZrI_4}$

(D) $\mathrm{ZnO} + \mathrm{C} \xrightarrow{\Delta} \mathrm{Zn} + \mathrm{CO}$

Answer: (A) $\mathrm{Ni} + 4\mathrm{CO} \xrightarrow{\Delta} \mathrm{Ni(CO)_4}$ · Key from source paper

Q18 JEE Main 2023 · 29 Jan · Shift 2 MCQ

The major component of which of the following ore is sulphide based mineral?

(A) Calamine

(B) Siderite

(C) Sphalerite

(D) Malachite

Answer: (C) Sphalerite · Key from source paper

Q19 JEE Main 2023 · 25 Jan · Shift 1 MCQ

Which one of the following reactions does not occur during extraction of copper ?

(A) $2\,\mathrm{Cu_2S} + 3\mathrm{O_2} \rightarrow 2\,\mathrm{Cu_2O} + 2\,\mathrm{SO_2}$

(B) $2\mathrm{FeS} + 3\mathrm{O_2} \rightarrow 2\mathrm{FeO} + 2\,\mathrm{SO_2}$

(C) $\mathrm{CaO} + \mathrm{SiO_2} \rightarrow \mathrm{CaSiO_3}$

(D) $\mathrm{FeO} + \mathrm{SiO_2} \rightarrow \mathrm{FeSiO_3}$

Answer: (C) $\mathrm{CaO} + \mathrm{SiO_2} \rightarrow \mathrm{CaSiO_3}$ · Key from source paper

Q20 JEE Main 2023 · 25 Jan · Shift 2 MCQ

Given below are two statements:-

Statement I:- In froth floatation method a rotating paddle agitates the mixture to drive air out of it.

Statement II:- Iron pyrites are generally avoided for extraction of iron due to environmental reasons.

In the light of the above statements, choose the correct answer from the options given below:-

(A) Both Statement I and Statement II are true

(B) Statement I is false but Statement II is true

(C) Statement I is true but Statement II is false

(D) Both Statement I and Statement II are false

Answer: (B) Statement I is false but Statement II is true · Key from source paper

Q21 JEE Main 2023 · 24 Jan · Shift 1 MCQ

Match List I with List II.

List I	List II
A. Reverberatory furnace	I. Pig iron
B. Electrolytic cell	II. Aluminium
C. Blast furnace	III. Silicon
D. Zone refining furnace	IV. Copper

(A) A - IV, B - II, C - I, D - III
(B) A - I, B - IV, C - II, D - III
(C) A - I, B - III, C - II, D - IV
(D) A - III, B - IV, C - I, D - II

Answer: (A) A - IV, B - II, C - I, D - III · Key from source paper

Q22 JEE Main 2023 · 24 Jan · Shift 2 MCQ

The metal which is extracted by oxidation and subsequent reduction from its ore is :

(A) Al
(B) Ag
(C) Cu
(D) Fe

Answer: (B) Ag · Key from source paper

Q23 JEE Main 2022 · 29 Jul · Shift 1 MCQ

In metallurgy the term "gangue" is used for

(A) Contamination of undesired earthy materials.
(B) Contamination of metals, other than desired metal
(C) Minerals which are naturally occuring in pure form
(D) Magnetic impurities in an ore.

Answer: (A) Contamination of undesired earthy materials. · Key from source paper

Q24 JEE Main 2022 · 29 Jul · Shift 2 MCQ

In liquation process used for tin Sn, the metal

(A) is reacted with acid
(B) is dissolved in water
(C) is brought to molten form which is made to flow on a slope
(D) is fused with NaOH,

Answer: (C) is brought to molten form which is made to flow on a slope · Key from source paper

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Q25 JEE Main 2022 · 28 Jul · Shift 1 MCQ

Which of the reaction is suitable for concentrating ore by leaching process?

(A) $2Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2SO_2$
(B) $Fe_3O_4 + CO \rightarrow 3FeO + CO_2$
(C) $Al_2O_3 + 2NaOH + 3H_2O \rightarrow 2NaAlOH_4$
(D) $Al_2O_3 + 6Mg \rightarrow 6MgO + 4Al$

Answer: (C) $Al_2O_3 + 2NaOH + 3H_2O \rightarrow 2NaAlOH_4$ · Key from source paper

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Q26 JEE Main 2022 · 28 Jul · Shift 2 MCQ

Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R
Assertion A : The reduction of a metal oxide is easier if the metal formed is in liquid state than solid state.
Reason R : The value of ΔG^{Θ} becomes more on negative side as entropy is higher in liquid state than solid state.
In the light of the above statements. Choose the most appropriate answer from the options given below

(A) Both A and R are correct and R is the correct explanation of A
(B) Both A and R are correct but R is NOT correct explanation of A
(C) A is correct but R is not correct
(D) A is not correct but R is correct

Answer: (A) Both A and R are correct and R is the correct explanation of A · Key from source paper

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Q27 JEE Main 2022 · 27 Jul · Shift 1 MCQ

Which of the following methods are not used to refine any metal?
(A) Liquation
(B) Calcination
(C) Electrolysis
(D) Leaching
(E) Distillation
Choose the correct answer from the options given below

(A) B and D only
(B) A, B, D and E only
(C) B, D and E only
(D) A, C and E only

Answer: (A) B and D only · Key from source paper

Q28 JEE Main 2022 · 27 Jul · Shift 2 Numerical

Among the following ores Bauxite, Siderite, Cuprite, Calamine, Haematite, Kaolinite, Malachite, Magnetite, Sphalerite, Limonite, Cryolite, the number of principal ores of iron is

Numerical value type: the answer is a number.

Answer: 4. · Key from source paper

Q29 JEE Main 2022 · 26 Jul · Shift 1 MCQ

Refining using liquation method is the most suitable for metals with

(A) Low melting point
(B) High boiling point
(C) High electrical conductivity
(D) Less tendency to be soluble in melts than impurities

Answer: (A) Low melting point · Key from source paper

Q30 JEE Main 2022 · 26 Jul · Shift 2 MCQ

The metal that is not extracted from its sulphide ore is

(A) Aluminium
(B) Iron
(C) Lead
(D) Zinc

Options (1) or (2) were accepted. More than one answer was accepted. · Key from source paper

Q31 JEE Main 2022 · 25 Jul · Shift 1 MCQ

The compound(s) that is(are) removed as slag during the extraction of copper is :
(1) CaO
(2) FeO
(3) Al_2O_3
(4) ZnO
(5) NiO
Choose the correct answer from the options given below

(A) 3, 4 only
(B) 2 only
(C) 1, 2, 5 Only
(D) 1, 2 only

Answer: (B) 2 only · Key from source paper

Q32 JEE Main 2022 · 25 Jul · Shift 2 MCQ

Given below are two statements.
Statement I : Pig iron is obtained by heating cast iron with scrap iron.
Statement II : Pig iron has a relatively lower carbon content than that of cast iron.
In the light of the above statements, choose the correct answer from the options given below.

(A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are not correct.
(C) Statement I is correct but Statement II is not correct
(D) Statement I is not correct but Statement II is correct.

Answer: (B) Both Statement I and Statement II are not correct. · Key from source paper

Q33 JEE Main 2022 · 29 Jun · Shift 1 MCQ

In isolation of which one of the following metals from their ores, the use of cyanide salt is commonly not involved?

(A) Zinc
(B) Silver
(C) Gold
(D) Copper

Answer: (D) Copper · Key from source paper

Q34 JEE Main 2022 · 29 Jun · Shift 2 MCQ

Match List I with List II.
List I With Ore
A.Siderite
B.Malachite
C.Sphalerite
D.Calamine
List II Composition
I.$FeCO_3$
II.$CuCO_3 \cdot Cu(OH)_2$
III.ZnS

IV.$ZnCO_3$

Choose the correct answer from the options given below:

(A) A-I, B-II, C-III, D-IV

(B) A-III, B-IV, C-E, D-I

(C) A-IV, B-III, C-I, D-II

(D) A-I, B-II, C-IV, D-III

Answer: (A) A-I, B-II, C-III, D-IV · Key from source paper

Q35 JEE Main 2022 · 28 Jun · Shift 1 MCQ

Given are two statements one is labelled as Assertion and other is labelled as Reason.

Assertion: Magnesium can reduce Al_2O_3 at a temperature below $1350\ ^\circ C$, while above $1350\ ^\circ C$ aluminium can reduce MgO.

Reason: The melting and boiling points of magnesium are lower than those of aluminium.

In light of the above statements, choose most appropriate answer from the options given below

(A) Both Assertion and Reason are correct, and Reason is correct explanation of Assertion.

(B) Both Assertion and Reason are correct, but Reason is NOT the correct explanation of Assertion.

(C) Assertion is correct Reason is not correct.

(D) Assertion is not correct, Reason is correct.

Answer: (B) Both Assertion and Reason are correct, but Reason is NOT the correct explanation of Assertion. · Key from source paper

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Q36 JEE Main 2022 · 28 Jun · Shift 2 MCQ

In the metallurgical extraction of copper, following reaction is used :

$FeO + SiO_2 \rightarrow FeSiO_3$

FeO and $FeSiO_3$ respectively are.

(A) gangue and flux.

(B) flux and slag

(C) slag and flux.

(D) Gauge and slag

Answer: (D) Gauge and slag · Key from source paper

Q37 JEE Main 2022 · 27 Jun · Shift 1 MCQ

Match List - I with List - II.

List-I

A Concentration of gold ore

B Leaching of alumina

C Froth stabiliser

D Blister copper

List-II
I Aniline
II NaOH
III SO_2
IV NaCN
Choose the correct answer from the options given below.

(A) (A) – (IV), (B) – (III), (C) – (II), (D) – (I)
(B) (A) – (IV), (B) – (II), (C) – (I), (D) – (III)
(C) (A) – (III), (B) – (II), (C) – (I), (D) – (IV)
(D) (A) – (II), (B) – (IV), (C) – (III), (D) – (I)

Answer: (B) (A) – (IV), (B) – (II), (C) – (I), (D) – (III) · Key from source paper

Q38 JEE Main 2022 · 27 Jun · Shift 2 MCQ

Statement I: Leaching of gold with cyanide ion in absence of air / O_2 leads to cyano complex of Au(III).
Statement II: Zinc is oxidized during the displacement reaction carried out for gold extraction.
In the light of the above statements, choose the correct answer from the options given below.

(A) Both Statement 1 and statement 2 are correct
(B) Both Statement 1 and statement 2 are incorrect
(C) Statement 1 is correct but statement 2 is incorrect
(D) Statement 1 is incorrect but statement 2 is correct

Answer: (D) Statement 1 is incorrect but statement 2 is correct · Key from source paper

Q39 JEE Main 2022 · 26 Jun · Shift 1 MCQ

Given below are two statements :
Statement I : According to the Ellingham diagram, any metal oxide with higher ΔG° is more stable than the one with lower ΔG°.
Statement II : The metal involved in the formation of oxide placed lower in the Ellingham diagram can reduce the oxide of a metal placed higher in the diagram.
In the light of the above statements, choose the most appropriate answer from the options given below

(A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are incorrect.
(C) Statement I is correct but Statement II is incorrect.
(D) Statement I is incorrect but Statement II is correct.

Answer: (D) Statement I is incorrect but Statement II is correct. · Key from source paper

Q40 JEE Main 2022 · 26 Jun · Shift 2 MCQ

The role of depressants in 'Froth Floation method' is to

(A) selectively prevent one component of the ore from coming to the froth.
(B) reduce the consumption of oil for froth formation.
(C) stabilize the froth.
(D) enhance non-wettability of the mineral particles.

Answer: (A) selectively prevent one component of the ore from coming to the froth. · Key from source paper

Q41 JEE Main 2022 · 25 Jun · Shift 1 MCQ

Leaching of gold with dilute aqueous solution of NaCN in presence of oxygen gives complex A, which on reaction with zinc forms the elemental gold and another complex B. A and B, respectively are

(A) $AuCN_2^-$ and $ZnCN_4^{2-}$
(B) $AuCN_4^-$ and $ZnCN_2OH_2^{2-}$
(C) $AuCN_2^-$ and $ZnOH_4^{2-}$
(D) $AuCN_4^{2-}$ and $ZnCN_6^{4-}$

Answer: (A) $AuCN_2^-$ **and** $ZnCN_4^{2-}$ · Key from source paper

Q42 JEE Main 2022 · 25 Jun · Shift 2 MCQ

Given below are two statements.
Statement I: During electrolytic refining. blister copper deposits precious metals.
Statement II: In the process of obtaining pure copper by electrolysis method, copper blister is used to make the anode.
In the light of the above statements, choose the correct answer from the options given below.

(A) Both Statement I and Statement II are true.
(B) Both Statement I and Statement II are false.
(C) Statement I is true but Statement II is false.
(D) Statement I is false but Statement II is true.

Answer: (A) Both Statement I and Statement II are true. · Key from source paper

Q43 JEE Main 2022 · 24 Jun · Shift 1 MCQ

Match List - I with List - II :

List-I	List-II
(A) Sphalerite	(I) $FeCO_3$
(B) Calamine	(II) PbS
(C) Galena	(III) $ZnCO_3$
(D) Siderite	(IV) ZnS

Choose the most appropriate answer from the options given below :

(A) (A) – (IV), (B) – (I), (C) – (II), (D) – (III)

(B) (A) – (IV), (B) – (III), (C) – (II), (D) – (I)

(C) (A) – (II), (B) – (II), (C) – (I), (D) – (IV)

(D) (A) – (III), (B) – (IV), (C) – (II), (D) – (I)

Answer: (B) (A) – (IV), (B) – (III), (C) – (II), (D) – (I) · Key from source paper

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Q44 JEE Main 2022 · 24 Jun · Shift 2 MCQ

Which of the following chemical reactions represents Hall-Heroult Process?

(A) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + 2Cr$

(B) $2\,Al_2O_3 + 3C \rightarrow 4Al + 3\,CO_2$

(C) $FeO + CO \rightarrow Fe + CO_2$

(D) $2[Au(CN)_2]^-(aq) + Zn(s) \rightarrow 2\,Au(s) + [Zn(CN)_4]^{2-}$

Answer: (B) $2\,Al_2O_3 + 3C \rightarrow 4Al + 3\,CO_2$ · Key from source paper

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Q45 JEE Main 2022 · 24 Jun · Shift 2 Numerical

(a) Baryte, (b) Galena, (c) Zinc blende and (d) Copper pyrites. How many of these minerals are sulphide based?

Numerical value type: the answer is a number.

Answer: 3. · Key from source paper

Q46 JEE Main 2021 · 1 Sep · Shift 2 MCQ

Calamine and Malachite, respectively, are the ores of :

(A) Copper and Iron

(B) Zinc and Copper

(C) Aluminium and Zinc

(D) Nickel and Aluminium

Answer: (B) Zinc and Copper · Key from source paper

Q47 JEE Main 2021 · 31 Aug · Shift 1 MCQ

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Aluminium is extracted from bauxite by the electrolysis of molten mixture of Al_2O_3 with cryolite.

Reason (R) : The oxidation state of Al in cryolite is $+3$.

In the light of the above statements, choose the most appropriate answer from the options given below :

(A) Both (A) and (R) are correct and (R) is the correct explanation of (A).
(B) (A) is true but (R) is false.
(C) Both (A) and (R) are correct but (R) is not the correct explanation of (A).
(D) (A) is false but (R) is true.

Answer: (C) Both (A) and (R) are correct but (R) is not the correct explanation of (A). · Key from source paper

Q48 JEE Main 2021 · 31 Aug · Shift 2 Numerical

In the electrolytic refining of blister copper, the total number of main impurities, from the following, removed as anode mud is _____.
Pb, Sb, Se, Te, Ru, Ag, Au and Pt

Numerical value type: the answer is a number.

Answer: 6. · Key from source paper

Q49 JEE Main 2021 · 27 Aug · Shift 1 MCQ

Which refining process is generally used in the purification of low melting metals?

(A) Chromatographic method
(B) Electrolysis
(C) Zone refining
(D) Liquation

Answer: (D) Liquation · Key from source paper

Q50 JEE Main 2021 · 27 Aug · Shift 2 MCQ

Match List-I with List-II :
List-I
(Name of ore/mineral)
a Calamine
b Malachite
c Siderite
d Sphalerite
List-I
(Chemical formula)
i ZnS
ii $FeCO_3$
iii $ZnCO_3$
iv $CuCO_3 \cdot Cu(OH)_2$
Choose the most appropriate answer from the options given below :

(A) (a) – (iv), (b) – (iii), (c) – (i), (d) – (ii)
(B) (a) – (iii), (b) – (ii), (c) – (iv), (d) – (i)
(C) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
(D) (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i)

Answer: (D) (a) – (iii), (b) – (iv), (c) – (ii), (d) – (i) · Key from source paper

Q51 JEE Main 2021 · 26 Aug · Shift 1 MCQ

Given below are two statements.
Statement I: The choice of reducing agents for metals extraction can be made by using the Ellingham diagram, a plot of ΔG vs temperature.
Statement II: The value of ΔS increases from left to right in the Ellingham diagram.
In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Statement I is false but Statement II is true
(B) Both Statement I and Statement II are true
(C) Statement I is true but Statement II is false
(D) Both Statenent I and Statement II are false

Answer: (C) Statement I is true but Statement II is false · Key from source paper

Q52 JEE Main 2021 · 26 Aug · Shift 2 MCQ

Given below are two statements:
Statement I : Sphalerite is a sulphide ore of zinc and copper glance is a sulphide ore of copper.
Statement II : It is possible to separate two sulphide ores by adjusting proportion of oil to water or by using 'depressants' in a froth flotation method.
Choose the most appropriate answer from the options given below :

(A) Statement I is true but Statement II is false.
(B) Both Statement I and Statement II are true.
(C) Both Statement I and Statement II are false.
(D) Statement I is false but Statement II is true.

Answer: (B) Both Statement I and Statement II are true. · Key from source paper

Q53 JEE Main 2021 · 27 Jul · Shift 1 MCQ

The statement that is INCORRECT about Ellingham diagram is

(A) provides idea about the reaction rate.
(B) provides idea about free energy change.
(C) provides idea about changes in the phases during the reaction.
(D) provides idea about reduction of metal oxide.

Answer: (A) provides idea about the reaction rate. · Key from source paper

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Q54 JEE Main 2021 · 27 Jul · Shift 2 MCQ

The addition of silica during the extraction of copper from its sulphide ore :-

(A) converts copper sulphide into copper silicate
(B) converts iron oxide into iron silicate
(C) reduces copper sulphide into metallic copper
(D) reduces the melting point of the reaction mixture

Answer: (B) converts iron oxide into iron silicate · Key from source paper

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Q55 JEE Main 2021 · 25 Jul · Shift 1 MCQ

In the leaching of alumina from bauxite, the ore expected to leach out in the process by reacting with NaOH is :

(A) TiO_2
(B) Fe_2O_3
(C) ZnO
(D) SiO_2

Answer: (D) SiO_2 · Key from source paper

Q56 JEE Main 2021 · 25 Jul · Shift 2 MCQ

Match List I with List II : (Both having metallurgical terms)
List-I | List-II
(a) Concentration of Ag ore | (i) Reverberatory furnace
(b) Blast furnace | (ii) Pig iron
(c) Blister copper | (iii) Leaching with dilute NaCN solution
(d) Froth floatation method | (iv) Sulfide ores
Choose the correct answer from the options given below.

(A) (a) – (iii), (b) – (ii), (c) – (i), (d) – (iv)
(B) (a) – (iii), (b) – (iv), (c) – (i), (d) – (ii)
(C) (a) – (iv), (b) – (i), (c) – (iii), (d) – (ii)
(D) (a) – (iv), (b) – (ii), (c) – (i), (d) – (iii)

Answer: (A) (a) – (iii), (b) – (ii), (c) – (i), (d) – (iv) · Key from source paper

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Q57 JEE Main 2021 · 22 Jul · Shift 1 MCQ

Sulphide ion is soft base and its ores are common for metals
(a) Pb (b) Al (c) Ag (d) Mg
Choose the correct answer from the options given below

(A) a and c only
(B) a and d only
(C) a and b only
(D) c and d only

Answer: (A) a and c only · Key from source paper

Q58 JEE Main 2021 · 20 Jul · Shift 1 MCQ

The metal that can be purified economically by fractional distillation method is:

(A) Fe
(B) Zn
(C) Cu
(D) Ni

Answer: (B) Zn · Key from source paper

Q59 JEE Main 2021 · 20 Jul · Shift 2 MCQ

Consider two chemical reactions (A) and (B) that take place during metallurgical process:
(A) $\mathrm{ZnCO_{3(s)} \xrightarrow{\Delta} ZnO_{(s)} + CO_{2(g)}}$
(B) $\mathrm{2\,ZnS_{(s)} + 3O_{2(g)} \xrightarrow{\Delta} 2\,ZnO_{(s)} + 2\,SO_{2(g)}}$
The correct option of names given to them respectively is:

(A) (A) is calcination and (B) is roasting
(B) Both (A) and (B) are producing same product so both are roasting
(C) Both (A) and (B) are producing same product so both are calcination
(D) (A) is roasting and (B) is calcination

Answer: (A) (A) is calcination and (B) is roasting · Key from source paper

Q60 JEE Main 2021 · 18 Mar · Shift 1 MCQ

The chemical that is added to reduce the melting point of the reaction mixture during the extraction of aluminium is:

(A) Cryolite
(B) Bauxite
(C) Calamine
(D) Kaolite

Answer: (A) Cryolite · Key from source paper

Q61 JEE Main 2021 · 18 Mar · Shift 2 MCQ

Match list-I with list-II :
List-I
List-II
(a) Mercury (i) Vapour phase refining
(b) Copper (ii) Distillation refining
(c) Silicon (iii) Electrolytic refining
(d) Nickel (iv) Zone refining
Choose the most appropriate answer from the option given below :

(A) a – i, b – iv, c – ii, d – iii
(B) a – ii, b – iii, c – i, d – iv
(C) a – ii, b – iii, c – iv, d – i
(D) a – ii, b – iv, c – iii, d – i

Answer: (C) a – ii, b – iii, c – iv, d – i · Key from source paper

Q62 JEE Main 2021 · 17 Mar · Shift 1 MCQ

The point of intersection and sudden increase in the slope, in the diagram given below, respectively, indicates:
(see the figure above)

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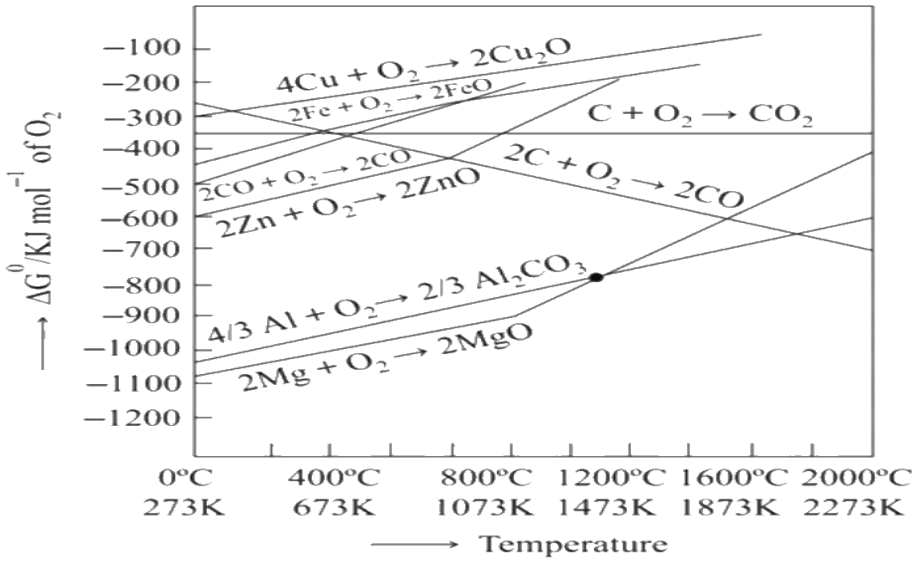
Q42. The point of intersection and sudden increase in the slope, in the diagram given below, respectively, indicates:



(1) $\Delta G = 0$ and melting or boiling point of the metal(2) $\Delta G > 0$ and decomposition of the metal oxide oxide
(3) $\Delta G < 0$ and decomposition of the metal oxide (4) $\Delta G = 0$ and reduction of the metal oxide

(A) $\Delta G = 0$ and melting or boiling point of the metal oxide
(B) $\Delta G > 0$ and decomposition of the metal oxide
(C) $\Delta G < 0$ and decomposition of the metal oxide
(D) $\Delta G = 0$ and reduction of the metal oxide

Answer: (A) $\Delta G = 0$ and melting or boiling point of the metal oxide · Key from source paper

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Q63 JEE Main 2021 · 17 Mar · Shift 2 MCQ

Match List-I and List-II :
List-I : a Haematite, b Bauxite, c Magnetite, d Malachite
List-II : i $Al_2O_3 \cdot xH_2O$, ii Fe_2O_3, iii $CuCO_3 \cdot Cu(OH)_2$, iv Fe_3O_4
Choose the correct answer from the options given below :

(A) (a) – (ii), (b) – (iii), (c) – (i), (d) – (iv)
(B) (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)
(C) (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)
(D) (a) – (ii), (b) – (i), (c) – (iv), (d) – (iii)

Answer: (D) (a) – (ii), (b) – (i), (c) – (iv), (d) – (iii) · Key from source paper

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Q64 JEE Main 2021 · 16 Mar · Shift 1 MCQ

The process that involves the removal of sulphur from the ores is :

(A) Smelting
(B) Roasting
(C) Leaching
(D) Refining

Answer: (B) Roasting · Key from source paper

Q65 JEE Main 2021 · 16 Mar · Shift 2 MCQ

Which of the following reduction reaction CANNOT be carried out with coke?

(A) $Al_2O_3 \rightarrow Al$
(B) $ZnO \rightarrow Zn$
(C) $Fe_2O_3 \rightarrow Fe$
(D) $Cu_2O \rightarrow Cu$

Answer: (A) $Al_2O_3 \rightarrow Al$ · Key from source paper

Q66 JEE Main 2021 · 26 Feb · Shift 1 MCQ

Match List-I with List-II.

List-I (Ore)	List-II (Element Present)
(a) Kernite	(p) Tin
(b) Cassiterite	(q) Boron
(c) Calamine	(r) Fluorine
(d) Cryolite	(s) Zinc

Choose the most appropriate answer from the options given below:

(A) (a) → (r), (b) → (p), (c) → (q), (d) → (s)
(B) (a) → (q), (b) → (s), (c) → (p), (d) → (r)
(C) (a) → (p), (b) → (r), (c) → (s), (d) → (q)
(D) (a) → (q), (b) → (p), (c) → (s), (d) → (r)

Answer: (D) (a) → (q), (b) → (p), (c) → (s), (d) → (r) · Key from source paper

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Q67 JEE Main 2021 · 26 Feb · Shift 2 MCQ

Match List-I with List-II.

List-I	List-II
(a) Siderite	(i) Cu
(b) Calamine	(ii) Ca
(c) Malachite	(iii) Fe
(d) Cryolite	(iv) Al
	(v) Zn

Choose the correct answer from the options given below:

(A) (a) → (iii), (b) → (i), (c) → (v), (d) → (ii)

(B) (a) → (i), (b) → (ii), (c) → (v), (d) → (iii)

(C) (a) → (iii), (b) → (v), (c) → (i), (d) → (iv)

(D) (a) → (i), (b) → (ii), (c) → (iii), (d) → (iv)

Answer: (C) (a) → (iii), (b) → (v), (c) → (i), (d) → (iv) · Key from source paper

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Q68 JEE Main 2021 · 25 Feb · Shift 1 MCQ

Ellingham diagram is a graphical representation of :

(A) ΔG vs P

(B) $(\Delta G - T\Delta S)$ vs T

(C) ΔH vs T

(D) ΔG vs T

Answer: (D) ΔG vs T · Key from source paper

Q69 JEE Main 2021 · 25 Feb · Shift 2 MCQ

The method used for the purification of Indium is:

(A) vapour phase refining

(B) liquation

(C) zone refining

(D) van Arkel method

Answer: (C) zone refining · Key from source paper

Q70 JEE Main 2021 · 24 Feb · Shift 1 MCQ

Al_2O_3 was leached with alkali to get X. The solution of X on passing of gas Y, forms Z.
X, Y and Z respectively are

(A) $X = AlOH_3, Y = CO_2, Z = Al_2O_3$

(B) $X = NaAlOH_4, Y = SO_2, Z = Al_2O_3$

(C) $X = AlOH_3, Y = SO_2, Z = Al_2O_3 \cdot xH_2O$

(D) $X = NaAlOH_4, Y = CO_2, Z = Al_2O_3, xH_2O$

Answer: (D) $X = NaAlOH_4, Y = CO_2, Z = Al_2O_3, xH_2O$ · Key from source paper

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Q71 JEE Main 2021 · 24 Feb · Shift 1 MCQ

Which of the following ore is concentrated using group 1 cyanide salt?

(A) Malachite
(B) Calamine
(C) Siderite
(D) Sphalerite

Answer: (D) Sphalerite · Key from source paper

Q72 JEE Main 2021 · 24 Feb · Shift 2 MCQ

Match List - I with List - II.
List-I (Metal)
(a) Aluminium
(b) Iron
(c) Copper
(d) Zinc
List-II (Ores)
(i) Siderite
(ii) Calamine
(iii) Kaolinite
(iv) Malachite
Choose the correct answer from the options given below:

(A) (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)
(B) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
(C) (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)
(D) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Answer: (D) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii) · Key from source paper

Q73 JEE Main 2020 · 6 Sep · Shift 2 MCQ

For a reaction $4\,\mathrm{M(s)} + n\mathrm{O_2(g)} \rightarrow 2\mathrm{M_2O_n(s)}$
The free energy change is plotted as a function of temperature. The temperature below which the oxide is stable could be inferred from the plot as the point at which :

(A) the slope change from negative to positive
(B) the free energy change show a change from negative to positive value
(C) the slope changes from positive to negative
(D) the slope changes from positive to zero

Answer: (B) the free energy change show a change from negative to positive value · Key from source paper

Q74 JEE Main 2020 · 6 Sep · Shift 2 MCQ

The element that can be refined by distillation is :

(A) nickel
(B) zinc
(C) tin
(D) gallium

Answer: (B) zinc · Key from source paper

Q75 JEE Main 2020 · 5 Sep · Shift 1 MCQ

An Ellingham diagram provides information about:

(A) the conditions of pH and potential under which a species is thermodynamically stable.
(B) the temperature dependence of the standard Gibbs energies of formation of some metal oxides.
(C) the pressure dependence of the standard electrode potentials of reduction reactions involved in the extraction of metals.
(D) the kinetics of the reduction process.

Answer: (B) the temperature dependence of the standard Gibbs energies of formation of some metal oxides. · Key from source paper

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Q76 JEE Main 2020 · 5 Sep · Shift 2 MCQ

Boron and silicon of very high purity can be obtained through :

(A) liquation
(B) zone refining
(C) vapour phase refining
(D) electrolytic refining

Answer: (B) zone refining · Key from source paper

Q77 JEE Main 2020 · 4 Sep · Shift 1 MCQ

Among statements (a) – (d), the correct ones are :
(a) Lime stone is decomposed to CaO during the extraction of iron from its oxides.
(b) In the extraction of silver, silver is extracted as an anionic complex.
(c) Nickel is purified by Mond's process.
(d) Zr and Ti are purified by Van Arkel method.

(A) (a), (b), (c) and (d)
(B) (a), (c) and (d) only
(C) (b), (c) and (d) only
(D) (c) and (d) only

Answer: (A) (a), (b), (c) and (d) · Key from source paper

Q78 JEE Main 2020 · 2 Sep · Shift 2 MCQ

Cast iron is used for the manufacture of :

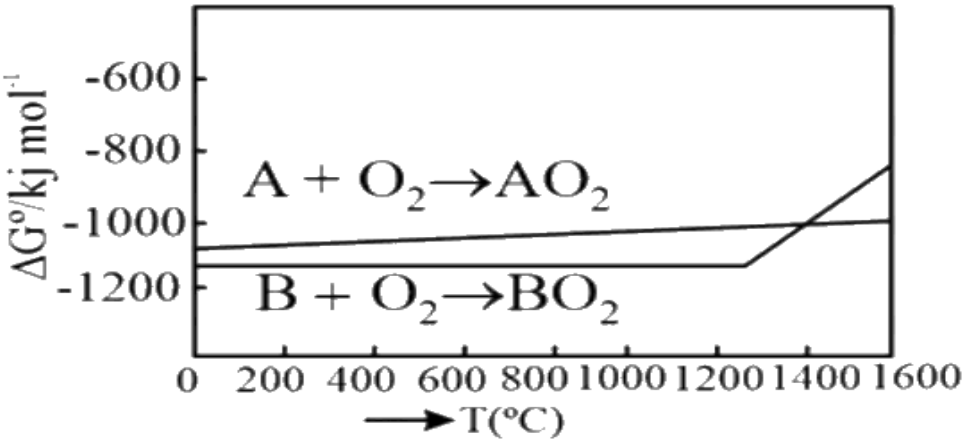
(A) wrought iron and pig iron
(B) pig iron, scrap iron and steel
(C) wrought iron, pig iron and steel
(D) wrought iron and steel

Answer: (D) wrought iron and steel · Checked by our team

Q79 JEE Main 2020 · 9 Jan · Shift 1 MCQ

According to the following diagram, A reduces BO_2 when the temperature is:
(see the figure above)

Q38. According to the following diagram, A reduces BO_2 when the temperature is:



(1) $< 1400°C$
(2) $> 1400°C$
(3) $> 1200°C$ but $< 1400°C$
(4) $< 1200°C$

(A) $< 1400^oC$
(B) $> 1400^oC$
(C) $> 1200^oC$ but $< 1400^oC$
(D) $< 1200^oC$

Answer: (B) $> 1400^oC$ · Key from source paper

Q80 JEE Main 2020 · 8 Jan · Shift 2 MCQ

Among the reactions (a) – (d), the reaction(s) that does/do not occur in the blast furnace during the extraction of iron is/are:
$(a)\ CaO + SiO_2 \rightarrow CaSiO_3$
$(b)\ 3Fe_2O_3 + CO \rightarrow 2Fe_3O_4 + CO_2$

$(c)\ FeO + SiO_2 \rightarrow FeSiO_3$
$(d)\ FeO \rightarrow Fe + \frac{1}{2}O_2$

(A) a
(B) a and d
(C) c and d
(D) d

Answer: (C) c and d · Key from source paper

Q81 JEE Main 2020 · 7 Jan · Shift 1 MCQ

The purest form of commercial iron is:

(A) pig iron
(B) wrought iron
(C) cast iron
(D) scrap iron and pig iron

Answer: (B) wrought iron · Key from source paper

Q82 JEE Main 2020 · 7 Jan · Shift 2 MCQ

The refining method used when the metal and the impurities have low and high melting temperatures, respectively, is

(A) liquation.
(B) vapour phase refining.
(C) zone refining.
(D) distillation.

Answer: (A) liquation. · Key from source paper

Q83 JEE Main 2019 · 12 Apr · Shift 1 MCQ

The idea of froth flotation method came from a person X and this method is related to the process Y of ores. X and Y, respectivity, are:

(A) Washer man and reduction
(B) Fisher women and concentration
(C) Fisher man and reduction
(D) Washer woman and concentration

Answer: (D) Washer woman and concentration · Key from source paper

Q84 JEE Main 2019 · 12 Apr · Shift 2 MCQ

The correct statement is:

(A) Pig iron is obtained from cast iron.

(B) The Hall-Heroult process is used for the production of aluminium and iron.

(C) leaching of bauxite using concentrated NaOH solution gives sodium aluminate and sodium silicate.

(D) the blistered appearance of copper during the metallurgical process is due to the evolution of CO_2.

Answer: (C) leaching of bauxite using concentrated NaOH solution gives sodium aluminate and sodium silicate. · Key from source paper

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Q85 JEE Main 2019 · 10 Apr · Shift 1 MCQ

Match the refining methods (Column I) with metals (Column II).

Column I

(Refining methods)

(I) Liquation

(II) Zone Refining

(III) Mond Process

(IV) Van Arkel Method

Column II

(Metals)

(a) Zr

(b) Ni

(c) Sn

(d) Ga

(A) (I) – (b); (II) – (c); (III) – (d); (IV) – (a)

(B) (I) – (b); (II) – (d); (III) – (a); (IV) – (c)

(C) (I) – (c); (II) – (d); (III) – (b); (IV) – (a)

(D) (I) – (c); (II) – (a); (III) – (b); (IV) – (d)

Answer: (C) (I) – (c); (II) – (d); (III) – (b); (IV) – (a) · Key from source paper

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Q86 JEE Main 2019 · 10 Apr · Shift 2 MCQ

The correct statement is:

(A) Aniline is a froth stabilizer.

(B) Zone refining process is used for the refining of titanium.

(C) Zincite is a carbonate ore.

(D) Sodium cyanide cannot be used in the metallurgy of silver.

Answer: (A) Aniline is a froth stabilizer. · Key from source paper

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Q87 JEE Main 2019 · 9 Apr · Shift 1 MCQ

The ore that contains the metal in the form of fluoride is known as which of the following?

(A) cryolite
(B) magnetite
(C) malachite
(D) sphalerite

Answer: (A) cryolite · Key from source paper

Q88 JEE Main 2019 · 9 Apr · Shift 2 MCQ

The one that is not a carbonate are is:

(A) malachite
(B) bauxite
(C) calamine
(D) siderite

Answer: (B) bauxite · Key from source paper

Q89 JEE Main 2019 · 9 Apr · Shift 2 MCQ

Assertion: For the extraction of iron, haematite ore is used.
Reason: Haematite is a carbonate ore of iron.

(A) Only the assertion is correct.
(B) Only the reason is correct.
(C) Both the assertion and reason are correct and the reason is the correct explanation for the assertion.
(D) Both the assertion and reason are correct, but the reason is not the correct explanation for the assertion.

Answer: (A) Only the assertion is correct. · Key from source paper

Q90 JEE Main 2019 · 8 Apr · Shift 1 MCQ

Which respect to an ore, Ellingham diagram helps to predict the feasibility of its

(A) Electrolysis
(B) Zone refining
(C) Vapour phase refining
(D) Thermal reduction

Answer: (D) Thermal reduction · Key from source paper

Q91 JEE Main 2019 · 8 Apr · Shift 2 MCQ

The Mond process is used for the:

(A) Purification of Zr and Ti
(B) Purification of Ni
(C) Extraction of Zn
(D) Extraction of Mo

Answer: (B) Purification of Ni · Key from source paper

Q92 JEE Main 2019 · 12 Jan · Shift 1 MCQ

In the Hall-Heroult process, aluminium is formed at the cathode. The cathode is made out of:

(A) Platinum
(B) Carbon
(C) Copper
(D) Pure aluminium

Answer: (B) Carbon · Key from source paper

Q93 JEE Main 2019 · 12 Jan · Shift 2 MCQ

The pair that does not require calcination is

(A) ZnO and $Fe_2O_3.xH_2O$
(B) ZnO and MgO
(C) $ZnCO_3$ and CaO
(D) Fe_2O_3 and $CaCO_3.MgCO_3$

Answer: (B) ZnO and MgO · Key from source paper

Q94 JEE Main 2019 · 11 Jan · Shift 1 MCQ

Match the ores (column A) with the metals (column B) :
(Column A) Ores
(I) Siderite
(II) Kaolinite
(III) Malachite
(IV) Calamine
(Column B) Metals
(a) Zinc
(b) Copper
(c) Iron
(d) Aluminium

(A) (I) - (a); (II) - (b); (III) - (c); (IV) - (d)
(B) (I) - (c); (II) - (d); (III) - (b); (IV) - (a)
(C) (I) - (c); (II) - (d); (III) - (a); (IV) - (b)
(D) (I) - (b); (II) - (c); (III) - (d); (IV) - (a)

Answer: (B) (I) - (c); (II) - (d); (III) - (b); (IV) - (a) · Key from source paper

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Q95 JEE Main 2019 · 11 Jan · Shift 2 MCQ

The reaction that does NOT define calcination is:

(A) $Fe_2O_3 \cdot xH_2O \xrightarrow{\Delta} Fe_2O_3 + xH_2O$
(B) $2Cu_2S + 3O_2 \xrightarrow{\Delta} 2Cu_2O + 2SO_2$
(C) $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2$
(D) $CaCO_3 \cdot MgCO_3 \xrightarrow{\Delta} CaO + MgO + 2CO_2$

Answer: (B) $2Cu_2S + 3O_2 \xrightarrow{\Delta} 2Cu_2O + 2SO_2$ · Key from source paper

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Q96 JEE Main 2019 · 10 Jan · Shift 1 MCQ

Hall Heroult's process is given by:

(A) $Cr_2O_3 + 2Al \rightarrow Al_2O_3 + Cr$
(B) $2Al_2O_3 + 3C \rightarrow 4Al + 3CO_2$
(C) $Cu^{2+}(aq) + H_2(g) \rightarrow Cu(s) + 2H^+(aq)$
(D) $ZnO + C \xrightarrow{\text{Coke,1673}} Zn + CO$

Answer: (B) $2Al_2O_3 + 3C \rightarrow 4Al + 3CO_2$ · Key from source paper

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Q97 JEE Main 2019 · 9 Jan · Shift 1 MCQ

The ore that contains both iron and copper is:

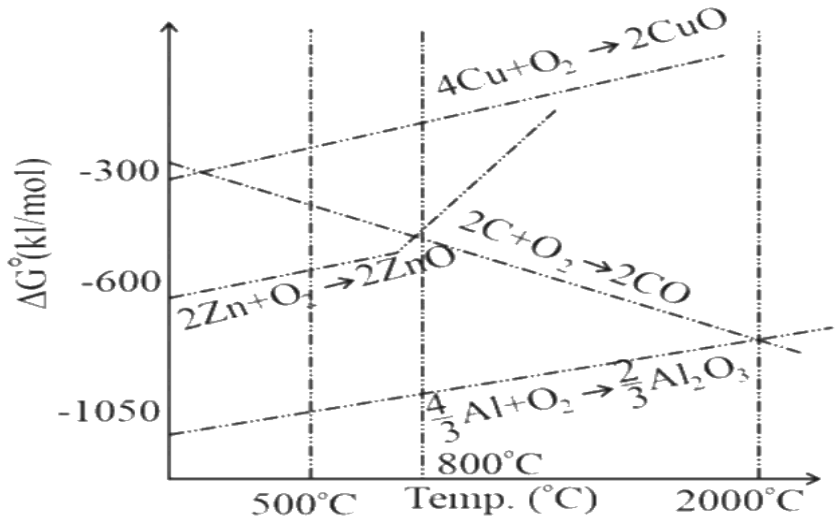
(A) Azurite
(B) Malachite
(C) Dolomite
(D) Copper pyrites

Answer: (D) Copper pyrites · Key from source paper

Q98 JEE Main 2019 · 9 Jan · Shift 2 MCQ

The correct statement regarding the given Ellingham diagram is:
(see the figure above)

Q48. The correct statement regarding the given Ellingham diagram is:



(1) At 1400^oC, Al can be used for the extraction of Zn from ZnO.
(2) At 500^oC, coke can be used for the extraction of Zn from ZnO
(3) At 800^oC, Cu can be used for the extraction of Zn from ZnO
(4) Coke cannot be used for the extraction of Cu from Cu_2O

(A) At 1400^oC, Al can be used for the extraction of Zn from ZnO.
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Answer: (A) At 1400^oC, Al **can be used for the extraction of** Zn **from** ZnO. · Key from source paper

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Q99 JEE Main 2018 · 16 Apr · Online MCQ

In the extraction of copper from its sulphide ore, metal is finally obtained by the oxidation of cuprous sulphide with:

(A) SO_2
(B) Fe_2O_3
(C) Cu_2O
(D) CO

Answer: (C) Cu_2O · Key from source paper

Q100 JEE Main 2018 · 15 Apr · Shift 2 MCQ

In the leaching method, bauxite ore is digested with a concentrated solution of NaOH that produces ' X '. When CO_2 gas is passed through the aqueous solution of ' X', a hydrated compound ' Y' ' is precipitated. ' X ' and ' Y ' respectively are.

(A) $Na\,[Al(OH)_4]$ and $Al_2(CO_3)_3 \cdot xH_2O$

(B) $Al(OH)_3$ and $Al_2O_3 \cdot xH_2O$

(C) $NaAlO_2$ and $Al_2(CO_3)_3 \cdot xH_2O$

(D) $Na\,[Al(OH)_4]$ and $Al_2O_3 \cdot xH_2O$

Answer: (D) $Na\,[Al(OH)_4]$ and $Al_2O_3 \cdot xH_2O$ · Key from source paper

Q101 JEE Main 2016 · 10 Apr · Online MCQ

Extraction of copper by smelting uses silica as an additive to remove.

(A) Cu_2O

(B) FeS

(C) FeO

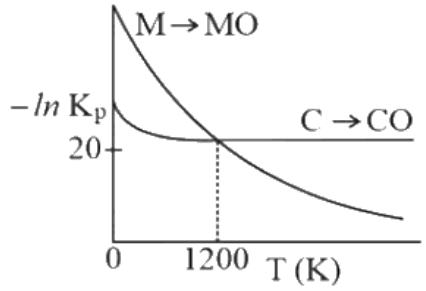
(D) Cu_2S

Answer: (C) FeO · Key from source paper

Q102 JEE Main 2016 · 9 Apr · Online MCQ

The plot shows the variation of $-\ln K_P$ Versus temperature for the two reactions.
$M(s) + \frac{1}{2}O_2(g) \rightarrow MO(s)$ and
$C(s) + \frac{1}{2}O_2(g) \rightarrow CO(s)$
(see the figure above)
Identify the correct statement:

Q50. The plot shows the variation of $-\ln K_P$ Versus temperature for the two reactions.
$M(s) + \frac{1}{2}O_2(g) \rightarrow MO(s)$ and
$C(s) + \frac{1}{2}O_2(g) \rightarrow CO(s)$



Identify the correct statement:

(1) At $T < 1200$ K, oxidation of carbon is unfavourable

(2) Oxidation of carbon is favourable at all temperatures

(3) At $T < 1200$ K, the reaction $MO(s) + C(s) \rightarrow M(s) + CO(g)$ is spontaneous

(4) At $T > 1200$ K, carbon will reduce $MO_{(s)}$ to $M_{(s)}$.

(A) At T < 1200 K, oxidation of carbon is unfavourable
(B) Oxidation of carbon is favourable at all temperatures
(C) At T < 1200 K, the reaction $\mathrm{MO(s) + C(s) \rightarrow M(s) + CO(g)}$ is spontaneous
(D) At T > 1200 K, carbon will reduce $\mathrm{MO_{(s)}}$ to $\mathrm{M_{(s)}}$.

Answer: (C) At T < 1200 K, the reaction $\mathrm{MO(s) + C(s) \rightarrow M(s) + CO(g)}$ is spontaneous · Key from source paper

Q103 JEE Main 2016 · 3 Apr · Offline MCQ

Which one of the following ores is best concentrated by froth flotation method?

(A) Galena
(B) Malachite
(C) Magnetite
(D) Siderite

Answer: (A) Galena · Key from source paper

Q104 JEE Main 2015 · 11 Apr · Online MCQ

Calamine is an ore of:

(A) Iron
(B) Copper
(C) Aluminium
(D) Zinc

Answer: (D) Zinc · Key from source paper

Q105 JEE Main 2015 · 10 Apr · Online MCQ

In the isolation of metals, calcination process usually results in:

(A) Metal oxide
(B) Metal carbonate
(C) Metal sulphide
(D) Metal hydroxide

Answer: (A) Metal oxide · Key from source paper

Q106 JEE Main 2015 · 4 Apr · Offline MCQ

In the context of the Hall-Heroult process for the extraction of Al, which of the following statements is false?

(A) Na_3AlF_6 serves as the electrolyte.

(B) CO and CO_2 are produced in this process.

(C) Al_2O_3 is mixed with CaF_2 which lowers the melting point of the mixture and brings conductivity.

(D) Al^{3+} is reduced at the cathode to form Al.

Answer: (A) Na_3AlF_6 serves as the electrolyte. · Key from source paper

Q107 JEE Main 2014 · 19 Apr · Online MCQ

Which one of the following ores is known as Malachite:

(A) Cu_2S

(B) Cu_2O

(C) $Cu(OH)_2.CuCO_3$

(D) $CuFeS_2$

Answer: (C) $Cu(OH)_2.CuCO_3$ · Key from source paper

Q108 JEE Main 2014 · 9 Apr · Online MCQ

The form of iron obtained from blast furnace is :

(A) Cast Iron

(B) Wrought Iron

(C) Steel

(D) Pig Iron

Answer: (D) Pig Iron · Key from source paper

Q109 JEE Main 2014 · 6 Apr · Offline MCQ

Which series of reactions correctly represents the chemical relations related to iron and its compound?

(A) $Fe \xrightarrow{\text{dilute } H_2SO_4} FeSO_4 \xrightarrow{H_2SO_4, O_2} Fe_2(SO_4)_3 \xrightarrow{\text{heat}} Fe$

(B) $Fe \xrightarrow{O_2, \text{heat}} FeO \xrightarrow{\text{dilute } H_2SO_4} FeSO_4 \xrightarrow{\text{heat}} Fe$

(C) $Fe \xrightarrow{Cl_2, \text{heat}} FeCl_3 \xrightarrow{\text{heat, air}} FeCl_2 \xrightarrow{Zn} Fe$

(D) $Fe \xrightarrow{O_2, \text{heat}} Fe_3O_4 \xrightarrow{CO, 600^\circ C} FeO \xrightarrow{CO, 700^\circ C} Fe$

Answer: (D) $Fe \xrightarrow{O_2, \text{heat}} Fe_3O_4 \xrightarrow{CO, 600^\circ C} FeO \xrightarrow{CO, 700^\circ C} Fe$ · Key from source paper

Q110 JEE Main 2013 · 22 Apr · Online MCQ

In Goldschmidt aluminothermic process which of the following reducing agents is used :

(A) calcium
(B) coke
(C) Al-powder
(D) sodium

Answer: (C) Al-powder · Key from source paper

Q111 JEE Main 2013 · 9 Apr · Online MCQ

Calcination is the process in which:

(A) ore is heated above its melting point to expel H_2O or CO_2 or SO_2
(B) ore is heated below its melting point to expel volatile impurities
(C) ore is heated above its melting point to remove S, As and Sb as SO_2, As_2O_3 and Sb_2O_3 respectively
(D) ore is heated below its melting point to expel H_2O or CO_2

Answer: (D) ore is heated below its melting point to expel H_2O or CO_2 · Key from source paper

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Q112 AIEEE 2012 · 26 May · Online MCQ

The substance used as froth stabilisers in forth-floatation process is

(A) Potassium ethyl xanthate
(B) Aniline
(C) Sodium cyanide
(D) Copper sulphate

Answer: (B) Aniline · Key from source paper

Q113 AIEEE 2012 · 19 May · Online MCQ

Extraction of zinc from zinc blende is achieved by

(A) roasting followed by self-reduction
(B) electrolytic reduction
(C) roasting followed by reduction with carbon
(D) roasting followed by reduction with another metal

Answer: (C) roasting followed by reduction with carbon · Key from source paper

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Q114 AIEEE 2012 · 12 May · Online MCQ

In the electrolysis of alumina to obtain aluminium metal, cryolite is added mainly to

(A) lower the melting point of alumina
(B) dissolve alumina in molten cryolite
(C) remove the impurities of alumina
(D) increase the electrical conductivity

Answer: (A) lower the melting point of alumina · Key from source paper

Q115 AIEEE 2012 · 7 May · Online MCQ

Which of the oxide groups among the following cannot be reduced by carbon?

(A) Cu_2O, SnO_2
(B) CaO, K_2O
(C) PbO, Fe_3O_4
(D) Fe_2O_3, ZnO

Answer: (B) CaO, K_2O · Key from source paper

Q116 AIEEE 2012 · Offline MCQ

Which method of purification is represented by the following equation:
$Ti(s) + 2I_2(g) \xrightarrow{523\ K} TiI_4(g) \xrightarrow{1700\ K} Ti(s) + 2I_2(g)$

(A) zone refining
(B) cupellation
(C) Poling
(D) Van Arkel

Answer: (D) Van Arkel · Key from source paper

Q117 AIEEE 2008 MCQ

Which of the following factors is of no significance for roasting sulphide ores to the oxides and not subjecting the sulphide ores to carbon reduction directly?

(A) Metal sulphides are thermodynamically more stable than CS_2
(B) CO_2 is thermodynamically more stable than CS_2
(C) Metal sulphides are less stable than the corresponding oxides
(D) CO_2 is more volatile than CS_2

Answer: (D) CO_2 **is more volatile than** CS_2 · Checked by our team

Q118 AIEEE 2005 MCQ

During the process of electrolytic refining of copper, some metals present as impurity settle as 'anode mud' These are

(A) Sn and Ag
(B) Pb and Zn
(C) Ag and Au
(D) Fe and Ni

Answer: (C) Ag and Au · Key from source paper

Q119 AIEEE 2005 MCQ

Heating mixture of Cu_2O and Cu_2S will give

(A) $Cu + SO_2$
(B) $Cu + SO_3$
(C) $CuO + CuS$
(D) Cu_2SO_3

Answer: (A) $Cu + SO_2$ · Key from source paper

Q120 AIEEE 2004 MCQ

Which one of the following ores is best concentrated by froth - floatation method?

(A) Magnetite
(B) Malachite
(C) Galena
(D) Cassiterite

Answer: (C) Galena · Key from source paper

Q121 AIEEE 2002 MCQ

When the sample of copper with zinc impurity is to be purified by electrolysis, the appropriate electrodes are

(A) cathode - pure zinc anode - pure copper
(B) cathode - impure sample anode - pure copper
(C) cathode - impure zinc anode - impure sample
(D) cathode - pure copper anode - impure sample

Answer: (D) cathode - pure copper anode - impure sample · Key from source paper

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Q122 AIEEE 2002 MCQ

Aluminium is extracted by the electrolysis of

(A) bauxite
(B) alumina
(C) alumina mixed with molten cryolite
(D) molten cryolite

Answer: (C) alumina mixed with molten cryolite · Key from source paper

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Q123 AIEEE 2002 MCQ

The metal extracted by leaching with a cyanide is

(A) Mg
(B) Ag
(C) Cu
(D) Na

Answer: (B) Ag · Key from source paper

Q124 AIEEE 2002 MCQ

Cyanide process is used for the extraction of

(A) barium
(B) aluminium
(C) boron
(D) silver

Answer: (D) silver · Key from source paper

EdLoop JEE