

1 Iron from a blast furnace is treated with oxygen and with calcium oxide to make steel.

Which substances in the iron are removed?

	oxygen removes	calcium oxide removes
<b>A</b>	carbon	acidic oxides
<b>B</b>	carbon	basic oxides
<b>C</b>	iron	acidic oxides
<b>D</b>	iron	basic oxides

2 Iron is obtained from its ore in a blast furnace and is used to make steel.

Iron obtained from the blast furnace is contaminated with .....1..... .

In order to remove this substance, .....2..... is passed through the molten iron.

.....3..... is also added to remove oxides of phosphorus and silicon which are .....4..... .

Which words complete the sentences about the conversion of iron to steel?

	1	2	3	4
<b>A</b>	carbon	nitrogen	calcium carbonate	acidic
<b>B</b>	carbon	oxygen	calcium oxide	acidic
<b>C</b>	carbon	oxygen	calcium oxide	basic
<b>D</b>	sand	oxygen	calcium oxide	basic

3 Iron is extracted from its ore (hematite) in the blast furnace.

Which gas is produced as a waste product?

- A** carbon dioxide
- B** hydrogen
- C** nitrogen
- D** oxygen

4 Iron is extracted from hematite in a blast furnace.

Which reaction increases the temperature in the blast furnace to over 1500 °C?

- A calcium carbonate → calcium oxide + carbon dioxide
- B calcium oxide + silicon dioxide → calcium silicate
- C carbon + oxygen → carbon dioxide
- D carbon dioxide + carbon → carbon monoxide

5 Which row describes the conditions used to make steel from the iron produced by a blast furnace?

	calcium oxide (lime)	oxygen	heat
A	✓	✓	✓
B	✓	✓	x
C	x	✓	✓
D	x	✓	x

6 Molten iron from the blast furnace contains impurities.

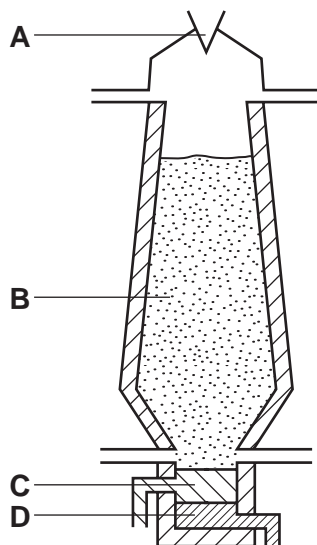
The process of turning the impure iron into steel involves blowing oxygen into the molten iron and adding calcium oxide.

What are the reasons for blowing in oxygen and adding calcium oxide?

	blowing in oxygen	adding calcium oxide
A	carbon is removed by reacting with oxygen	reacts with acidic impurities making slag
B	carbon is removed by reacting with oxygen	reacts with slag and so removes it
C	iron reacts with the oxygen	reacts with acidic impurities making slag
D	iron reacts with the oxygen	reacts with slag and so removes it

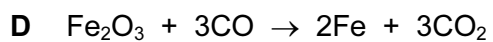
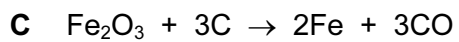
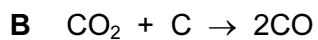
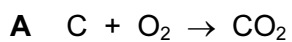
7 The diagram shows a blast furnace.

In which part is iron ore changed to iron?

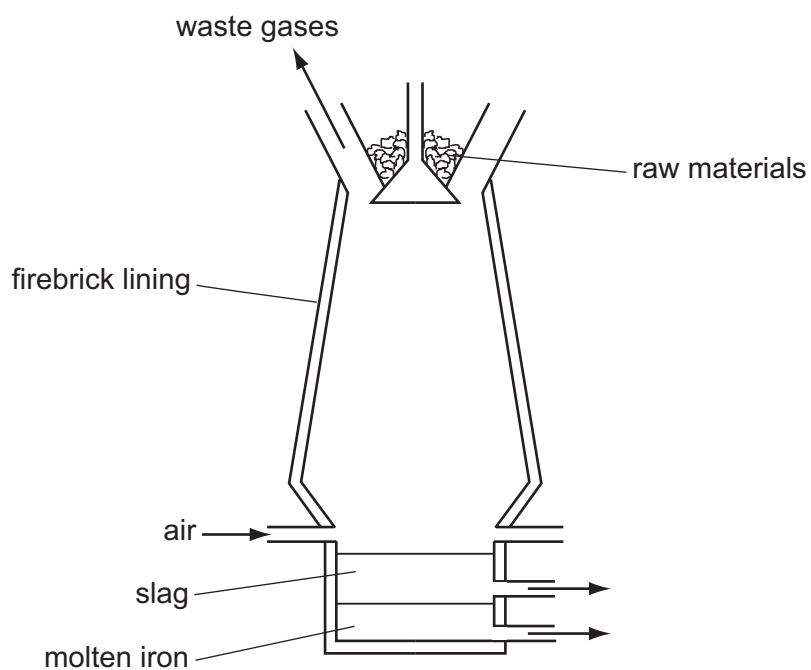


8 Four reactions that take place in the blast furnace to produce iron are shown.

Which reaction is used to keep the furnace hot?



9 Iron is extracted from hematite in the Blast Furnace.



The hematite contains silica as an impurity.

What reacts with this impurity to remove it?

- A calcium oxide
- B carbon
- C carbon dioxide
- D oxygen

10 Which substance is **not** involved in the extraction of iron from hematite?

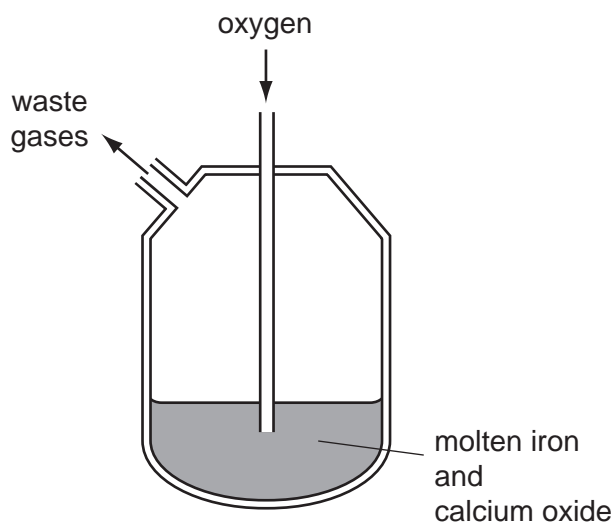
- A carbon
- B carbon monoxide
- C calcium carbonate
- D nitrogen

- 11 Which statement is incorrect?
- A** Carbon dioxide is a waste product in the extraction of iron.
  - B** Carbon monoxide is a reducing agent.
  - C** The extraction of iron from hematite involves reduction.
  - D** When iron is converted into steel, oxygen is used to oxidise the iron.

12 The Basic Oxygen Process converts iron into steel.

In step 1, oxygen is blown into impure molten iron.

In step 2, oxides are removed by reaction with calcium oxide.



Which chemical reaction takes place in step 1 and which type of oxides are removed in step 2?

	chemical reaction in step 1	type of oxides removed in step 2
<b>A</b>	carbon is converted to carbon dioxide	acidic
<b>B</b>	carbon is converted to carbon monoxide	basic
<b>C</b>	iron is converted to iron(III) oxide	acidic
<b>D</b>	iron is converted to iron(III) oxide	basic

13 Iron is extracted from its ore in a Blast Furnace.

Hematite, coke, limestone and hot air are added to the furnace.

Which explanation is **not** correct?

- A Coke burns and produces a high temperature.
- B Hematite is the ore containing the iron as iron oxide.
- C Hot air provides the oxygen for the burning.
- D Limestone reduces the iron oxide to iron.

14 Which statement about the extraction of iron from its ore is correct?

- A Iron is more difficult to extract than zinc.
- B Iron is more difficult to extract than copper.
- C Iron is easy to extract because it is a transition metal.
- D Iron cannot be extracted by reduction with carbon.

15 Many metals are extracted from their ores by heating the metal oxide with carbon.

Which metal **cannot** be extracted using this method?

- A aluminium
- B copper
- C iron
- D zinc

16 A metal is extracted from hematite, its oxide ore.

What is the metal and how is the oxide reduced?

	metal	method of reduction
<b>A</b>	Al	electrolysis
<b>B</b>	Al	heating with carbon
<b>C</b>	Fe	electrolysis
<b>D</b>	Fe	heating with carbon

17 Which row describes the conditions used to make steel from the iron produced by a blast furnace?

	calcium oxide (lime)	oxygen	heat
<b>A</b>	✓	✓	✓
<b>B</b>	✓	✓	x
<b>C</b>	x	✓	✓
<b>D</b>	x	✓	x

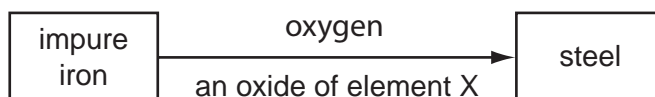
18 Some metals react readily with dilute hydrochloric acid.

Some metals can be extracted by heating their oxides with carbon.

For which metal are **both** statements correct?

- A** calcium
- B** copper
- C** iron
- D** magnesium

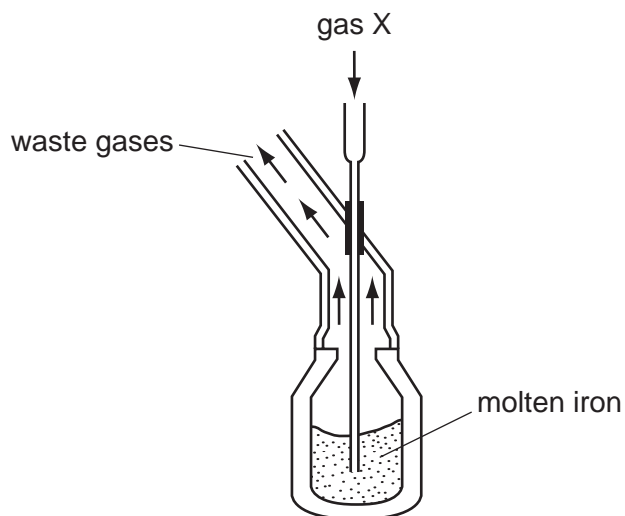
19 The diagram shows the materials used in the production of steel from impure iron.



What could element X be?

- A** calcium
- B** carbon
- C** nitrogen
- D** sulfur

20 The diagram shows the manufacture of steel.

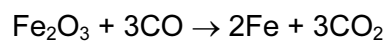


What is gas X?

- A** carbon dioxide
- B** chlorine
- C** hydrogen
- D** oxygen



- 21 In a blast furnace, iron(III) oxide is converted to iron and carbon monoxide is converted to carbon dioxide.



What happens to each of these reactants?

- A** Both iron(III) oxide and carbon monoxide are oxidised.
- B** Both iron(III) oxide and carbon monoxide are reduced.
- C** Iron(III) oxide is oxidised and carbon monoxide is reduced.
- D** Iron(III) oxide is reduced and carbon monoxide is oxidised.