Sulfur – 2021 IGCSE 0620

1. Nov/2021/Paper_11,12&13/No.31

Sulfur burns to make sulfur dioxide.

Which row describes a source of sulfur and a use of sulfur dioxide?

	source of sulfur	use of sulfur dioxide
A	the air	food preservative
B	the air	treating acidic soils
C	underground deposits	food preservative
D	underground deposits	treating acidic soils

2. Nov/2021/Paper_21/No.31

Which raw material is used in the Contact process?

A air

B ammonia

C carbon

D nitrogen

3. Nov/2021/Paper_22/No.31

Which reaction involving sulfur dioxide is correct?

A It is produced during the extraction of zinc from zinc blende.

B It reacts with concentrated sulfuric acid to form oleum.

C It reacts with sulfur to form sulfur trioxide.

D It turns an acidified solution of potassium manganate(VII) purple.

4. Nov/2021/Paper_23/No.31

One of the steps in manufacturing sulfuric acid in the Contact process is shown.

$$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$$

Which catalyst is used to increase the rate of this reaction?

A aluminium oxide

B iron

C phosphoric acid

D vanadium(V) oxide

5. Nov/2021/Paper_32/No.7

This question is about sulfur and compounds of sulfur.

(a) Use the kinetic particle theory to describe the differences between sulfur gas and solid sulfur in terms of:

- the arrangement of the particles

.....

.....

.....

- the separation of the particles.

.....

.....

.....

[4]

(b) Give the major use of sulfur in industry.

..... [1]

(c) Sulfur dioxide is a pollutant in the air that contributes to acid rain.

(i) State **one** adverse effect of sulfur dioxide on health.

..... [1]

(ii) Name one **other** oxide that contributes to acid rain.

..... [1]

(iii) Sulfur dioxide reacts with water to produce sulfurous acid.
The reaction is reversible.

Draw the symbol for a reversible reaction in the box.

$SO_2 + H_2O$ ☐ H_2SO_3 [1]

(d) The equation for the reaction of sodium sulfite with zinc is shown.

$$Na_2SO_3 + 3Zn \rightarrow Na_2S + 3ZnO$$

Explain how this equation shows that zinc is oxidised.

.....

..... [1]

[Total: 9]

6. Nov/2021/Paper_41/No.4

Chalcopyrite, $FeCuS_2$, is used in the manufacture of sulfuric acid in the Contact process.

(a) In the first stage of the process, chalcopyrite reacts with oxygen in the air to produce sulfur dioxide, SO_2, iron(III) oxide and copper(II) oxide.

Complete the chemical equation for the reaction of $FeCuS_2$ with oxygen.

$$4FeCuS_2 + 13O_2 \rightarrow \text{.....} + \text{.....} + \text{.....} \quad [2]$$

(b) Sulfur dioxide is then converted to sulfur trioxide.

$$2SO_2 + O_2 \rightleftharpoons 2SO_3$$

The reaction is exothermic. It is also an equilibrium.

(i) State **two** features of an equilibrium.

1 .....

2 .....

[2]

(ii) State the temperature and pressure used in this reaction.
Include units.

- temperature .....
- pressure .....

[2]

(iii) Name the catalyst used.

..... [1]

(iv) Explain why a catalyst is used.

..... [1]

(v) Describe and explain, in terms of equilibrium, what happens when the temperature is increased.

.....

..... [2]

(c) Concentrated sulfuric acid is a dehydrating agent.

When glucose is dehydrated, carbon and one other product are formed.

Complete the equation to show the dehydration of glucose, $C_6H_{12}O_6$.

$C_6H_{12}O_6 \rightarrow$ .....C + ... [2]

[Total: 12]