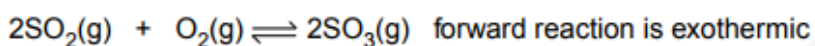


Sulfur

Past Year Topical Questions

Oct/Nov 2002

- 1 (a) Sulphuric acid is made by the Contact Process.



- (i) What are the reaction conditions for the Contact Process?

.....
.....[3]

- (ii) Would the yield of sulphur trioxide increase, decrease or stay the same when the temperature is increased? Explain your answer.

.....
.....
.....[2]

- (iii) Describe how sulphur trioxide is changed into concentrated sulphuric acid.

.....
.....[2]

Oct/Nov 2003

5 Sulphur dioxide, SO_2 , and sulphur trioxide, SO_3 , are the two oxides of sulphur.

(a) Sulphur dioxide can kill bacteria and has bleaching properties. Give a use of sulphur dioxide that depends on each of these properties.

(i) ability to kill bacteria[1]

(ii) bleaching properties[1]

(b) Sulphur trioxide can be made from sulphur dioxide.

(i) Why is this reaction important industrially?

.....[1]

(ii) Complete the word equation.

sulphur dioxide + \rightarrow sulphur trioxide [1]

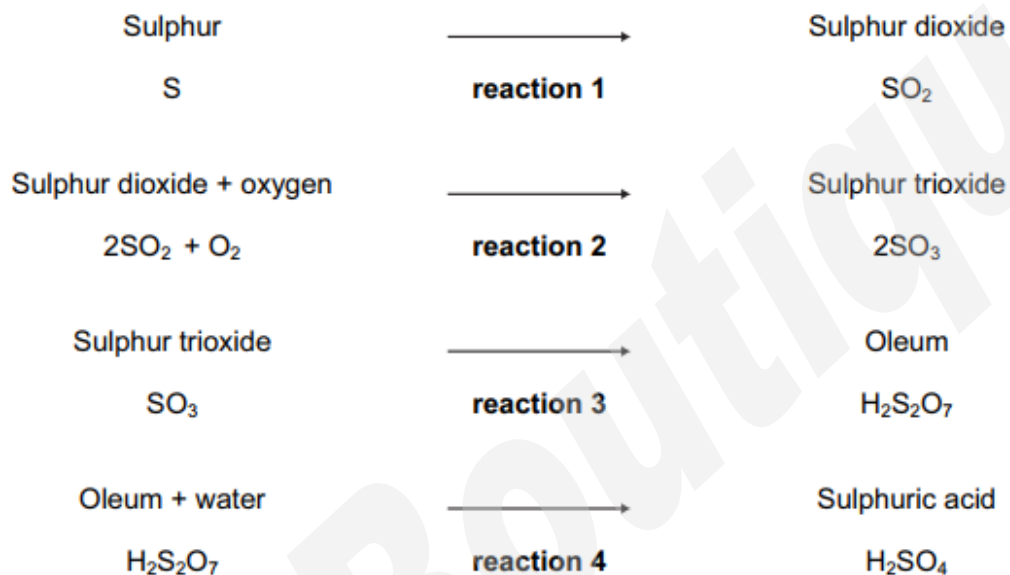
(iii) What are the conditions for this reaction?

.....
.....[2]

May/June 2004

2 Sulphur is used to make sulphuric acid. In the UK, the annual production of the acid is about 2.5 million tonnes.

(a) The reactions in the manufacture of sulphuric acid by the Contact Process are shown below.



(i) Give a large scale source of the element sulphur.

..... [1]

(ii) State another use of sulphur dioxide.

..... [1]

(iii) How is sulphur changed into sulphur dioxide?

..... [1]

(iv) Name the catalyst used in reaction 2.

..... [1]

(v) Reaction 2 is exothermic. Why is a catalyst, rather than a higher temperature, used to increase the rate of this reversible reaction?

.....
..... [2]

(vi) Write a word equation for reaction 3.

..... [1]

(vii) Write a symbol equation for reaction 4.

..... [1]

May/June 2005

- (c) Sulphuric acid is manufactured by the Contact Process. Sulphur dioxide is oxidised to sulphur trioxide by oxygen.



- (i) Name the catalyst used in this reaction.

..... [1]

- (ii) What temperature is used for this reaction?

..... [1]

- (iii) Describe how sulphur trioxide is changed into sulphuric acid.

.....
..... [2]

May/June 2006

- 5 Sulphuric acid is made by the Contact process in the following sequence of reactions.

sulphur → sulphur dioxide → sulphur trioxide → sulphuric acid

- (a) (i) How is sulphur dioxide made from sulphur?

..... [1]

- (ii) Sulphur dioxide has other uses.
Why is it used in the manufacture of paper?

..... [1]

- (iii) How does it preserve food?

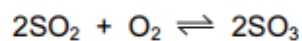
..... [1]

(iv) Describe how the sulphur trioxide is changed into concentrated sulphuric acid.

.....
..... [2]

Oct/Nov 2009

6 (a) Sulfuric acid is made by the Contact process.



This is carried out in the presence of a catalyst at 450 °C and 2 atmospheres pressure.

(i) How is the sulfur dioxide made?

.....
..... [1]

(ii) Give another use of sulfur dioxide.

..... [1]

(iii) Name the catalyst used.

..... [1]

- (iv) If the temperature is decreased to 300 °C, the yield of sulfur trioxide increases. Explain why this lower temperature is not used.

.....
..... [1]

- (v) Sulfur trioxide is dissolved in concentrated sulfuric acid. This is added to water to make more sulfuric acid. Why is sulfur trioxide not added directly to water?

.....
..... [1]