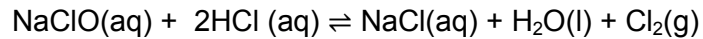


0 6

Bleach is a solution of sodium hypochlorite (NaClO).

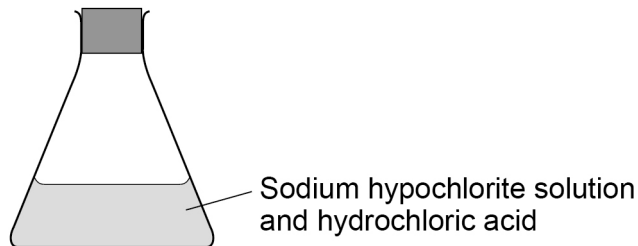
Chlorine gas is produced when bleach reacts with hydrochloric acid.

**0 6 . 1**

Give the test and result for chlorine gas.

[2 marks]

Figure 8 shows a sealed flask of sodium hypochlorite and hydrochloric acid at equilibrium.

Figure 8**0 6 . 2**

Explain why equilibrium is reached in this reaction.

[2 marks]



0 6 . 3

The stopper in **Figure 8** is removed and hydrochloric acid is added.

The stopper is replaced.

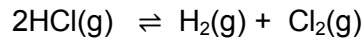
Explain what happens to the equilibrium.

[4 marks]

Question 6 continues on the next page

Turn over ►

Chlorine gas is also produced when hydrogen chloride decomposes.



The forward reaction is endothermic.

0 6 . 4

Predict the effect of increasing the temperature on the amount of chlorine gas produced at equilibrium.

Explain your answer using Le Chatelier's Principle.

[2 marks]

0 6 . 5

Explain the effect of increasing the pressure on this equilibrium.

[2 marks]

12

END OF QUESTIONS

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Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	<u>damp / moist</u> litmus paper	ignore colour of litmus paper	1	AO1 5.8.2.4
	bleaches / goes white		1	
06.2	forward and reverse rates equal	allow closed system allow particles for reactants or products	1	AO1 5.6.2.1 5.6.2.3 AO2 5.6.2.1 5.6.2.3
	because no escape of reactants or products		1	
06.3	equilibrium shifts	allow no longer in equilibrium	1	AO3 5.6.2.3 5.6.2.4 5.6.2.5 5.6.2.7
	to right-hand side	allow in favour of forward reaction	1	
	to produce more of any products or to reduce any reactants	allow correct references to Le Chatelier's Principle	1	
	(new) equilibrium will be established		1	
06.4	amount of chlorine gas increases	allow (because) system shifts to take in energy allow (because) system shifts in endothermic direction	1	AO2 5.6.2.4 5.6.2.6 AO1 5.6.2.4 5.6.2.6
	(because) system shifts to counteract the change		1	
06.5	no change		1	AO2 5.6.2.4 5.6.2.7 AO1 5.6.2.4 5.6.2.7
	because equal numbers of molecules or moles (of gas) on each side		1	
Total			12	