

AS level Chemistry A

H032/02 Depth in chemistry

Question Set 9

1. This question is about halogens.
- (a) Bromine is used to extract iodine from a solution containing iodide ions.
- (i) Write an ionic equation for the reaction. [1]
- (ii) Explain why iodine is less reactive than bromine. [3]
- (b) Iodine can be used for the small-scale purification of drinking water.
- (i) Iodine reacts with water as shown below.



Using oxidation numbers, explain why this reaction is a disproportionation. [3]

- (ii) Chlorine is used to purify water on a large scale.

State **one** disadvantage of using chlorine for the purification of drinking water. [1]

- (c) Hydrogen reacts with chlorine to form hydrogen chloride, HCl :

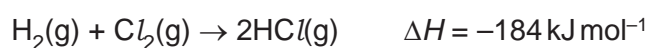


Table 3.1 shows bond enthalpies.

Bond	Bond Enthalpy/ kJ mol^{-1}
H–H	+436
Cl–Cl	+243

Table 3.1

Calculate the bond enthalpy, in kJ mol^{-1} , for the H–Cl bond from the information above. [2]

- (d) 'Enthalpy change of vaporisation' is the enthalpy change when one mole of a substance changes from a liquid to a gas at its boiling point.
- (i) Write an equation, including state symbols, to represent the enthalpy change of vaporisation of bromine. [1]
- (ii) Suggest whether the enthalpy change of vaporisation of bromine is exothermic or endothermic.

Explain your answer. [1]

Total Marks for Question Set 3: 12

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