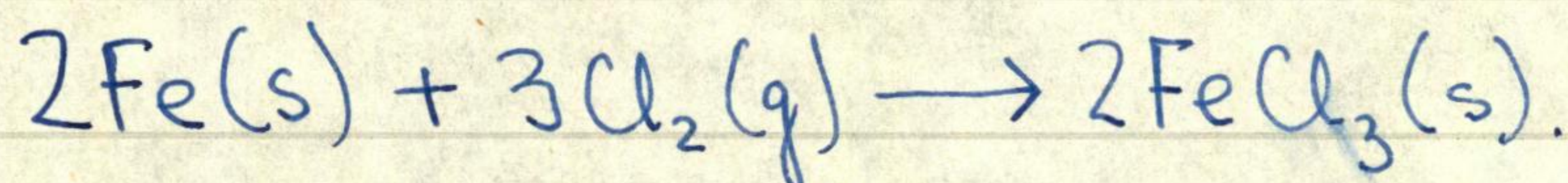


1(a)(i) The black crystals formed in this reaction are those of iron (II) Chloride, FeCl_2 .

The equation for this reaction is:



(ii) Three members of the halogen family other than Chlorine are: Fluorine, Bromine and Iodine.

(iii) Fluorine would react more vigorously with iron than is the case with Chlorine.

Bromine would react less vigorously with iron compared to chlorine. (mixture of products also formed, iron (II) bromide and iron (III) bromide)

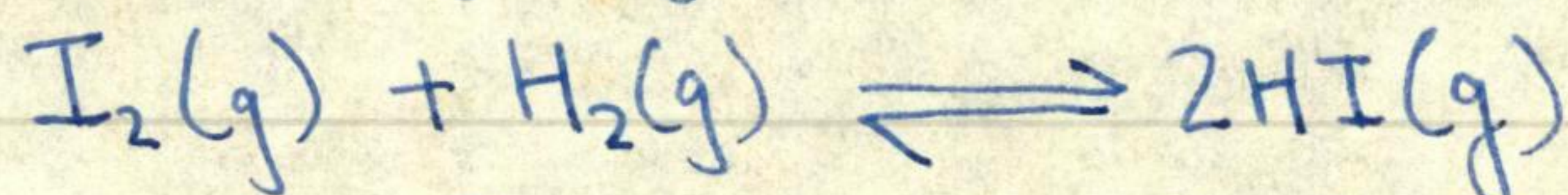
Iodine ^{would} show a very little sign of reactivity with iron compared to chlorine. (some iron (II) iodide is formed e.g. $\text{Fe}(s) + \text{I}_2(g) \rightarrow \text{FeI}_2(s)$)

(b)(i) Chlorine reacts readily with hydrogen (without heating) in diffused daylight, and in bright sunlight the mixture explodes.

(ii) Fluorine explodes when it is mixed with hydrogen, even in the dark and at a very low temperature. $\text{F}_2(g) + \text{H}_2(g) \rightarrow 2\text{HF}(g)$

Bromine will not react with Hydrogen even in sunlight, as compared with Chlorine. The mixture needs to be heated to about 200°C before any reaction takes place. $\text{Br}_2(g) + \text{H}_2(g) \rightarrow 2\text{HBr}(g)$

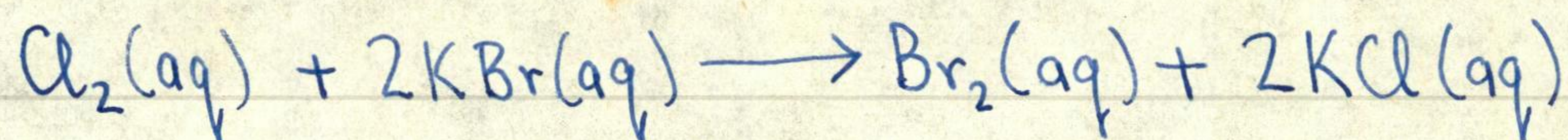
Iodine will not react with hydrogen at all, even when the mixture is heated to 500°C . At this temperature, in the presence of a catalyst, Iodine and Hydrogen still do not give a complete reaction.



We see that in Group 7 the elements become LESS reactive with increasing atomic number.

(c) Two halogens which react with Potassium Bromide solution are Fluorine and Chlorine (Why is Fluorine not normally used).

An equation for one of these reactions is %



2(a)

Element	Colour	Solubility in water	Reactivity	State
Chlorine	Yellowish-Green	dissolves readily	very reactive	Gas
Bromine	Reddish-brown	dissolves moderately	less reactive than chlorine	Liquid
Iodine	Silvery	dissolves only in hot water		Solid

(b)(i) We treat a solution of the 3 salts with Silver Nitrate solution. In all 3 cases a precipitate will be formed. The chloride yields a white precipitate of silver chloride which is soluble in ammonium hydroxide; the bromide yields a pale yellow precipitate of silver bromide which is moderately soluble in ammonium hydroxide; the iodide yields a ~~pale~~ yellow precipitate of silver iodide which is insoluble in ammonium hydroxide solution.

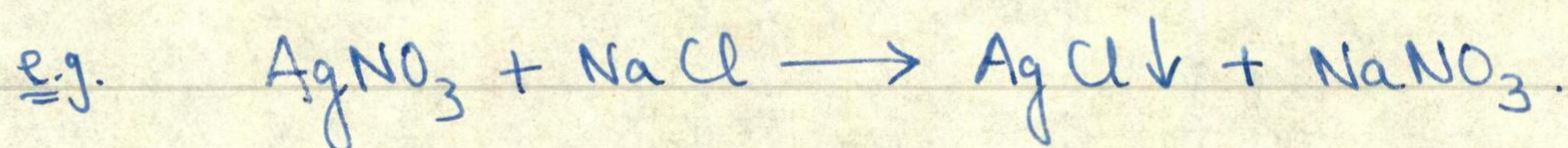
(ii) Some chlorine water and tetrachloromethane (CCl_4) are added to a test tube in which they will form 2 layers. On adding a chloride no change is observed. If a bromide is added a brown colour will be seen in the CCl_4 layer; if an iodide is added a purple colouration is seen in the non-aqueous layer.

3. The answers are:

1(c), 2(d), 3(d), 4(a), 5(a), 6(b), 7(d), 8(c), 9(b), 10(d).

4. Chlorine is used as bleach (^{when} moist), for sterilizing water, and its compounds are solvents, insecticides, antiseptics, anaesthetics, weedkillers etc.

Test for chloride ions: Chlorides give a white precipitate of Silver Chloride on treatment with silver nitrate solution.



PLEASE STUDY CLOSELY !!!

ADULT EDCTN. DIVISION.