Oxford Cambridge and RSA

GCSE Chemistry A (Gateway Science)

J248/02 C4-C6 and C7 Foundation (Foundation Tier)

Question Set 10

1 The Group 7 elements are known as the halogens.

The halogens have similar chemical properties.

Their physical properties vary with increasing atomic number.

(a) Look at the table of information about the halogens.

Halogen	Symbol	Atomic number	Molecular formula	Atomic radius (in pm)	Reaction of halogen with sodium iodide solution
fluorine	F	9	F_2	64	Makes iodine and sodium fluoride
chlorine	Cl	17	Cl_2	99	Makes iodine and sodium chloride
bromine	Br	35	Br_2	114	Makes iodine and sodium bromide
iodine	I	53	I_2	133	No reaction
astatine	At	85	At_2	148	No reaction

(i) Predict the molecular formula and atomic radius of astatine.

Put your answers in the table. **[2]**

(ii) Predict the reaction of bromine with sodium iodide solution.

Put your answer in the table. **[1]**

(iii) Explain your answer to **(ii)** in terms of the reactivity of the halogens.

Bromine is more reactive than iodine **[1]**

(b) All halogens react with alkali metals to make a salt.

(i) All halogens have similar chemical reactions.

Explain why in terms of electronic structure.

Because they all have same number of electrons (7) in the outer shell (since they are all from group 7) **[1]**

(ii) Sodium reacts with bromine to make sodium bromide, NaBr.

Construct the **balanced symbol** equation for this reaction.

$2Na + Br_2 \rightarrow 2NaBr$ **[2]**

(iii) What is the formula of the product of the reaction between astatine and potassium?

KAt **[1]**

Total Marks for Question Set 10: 8