Chapter 10 Group 7 - GCSE Assumed Knowledge

Learning Objectives	Keypoints
Recall physical and chemical properties of Group 7 elements	The group 7 elements are known as the halogens. Fluorine is a pale yellow gas. Chlorine is a pale green gas. Bromine is an orange-brown liquid. Iodine is a grey-black solid. The density of group 7 elements increases down the group. The melting and boiling points of group 7 elements increase down the group. The group 7 elements react with Group 1 metals to produce salts. The general equation is: $2M + X_2 \rightarrow 2MX$ The chemical reactivity of the halogens decreases as you go down the group. This can be explained by the fact that non-metals gain electrons when they react. As you go down the group the atoms get bigger, which means it is harder to gain an electron.
Explain the reactions of Group 7 elements	Group 7 elements are non-metals with 7 electrons in their outer shell. In order to react they can either form covalent compounds with other non-metal elements, or they can form ionic compounds with a metal.
Describe and explain displacement reactions between halides and halogens	A more reactive halogen will displace a less reactive halide from a compound. For example, chlorine is more reactive than iodine so the following reaction will happen: Chlorine + potassium iodide → potassium chloride + iodine By contrast, if chlorine was added to potassium fluoride there would be no reaction as the chlorine would not be reactive enough to displace the fluorine from its compound.
Predict properties from given trends	The trends in melting points, densities and chemical reactivities of the Group 7 elements can be used to predict the properties of the rarer elements such as francium and astatine.
Describe tests to detect halides	To detect halide ions: Add a few drops of nitric acid. Add a few drops of silver nitrate solution. Record the colour of the precipitate Chloride = white precipitate, bromide = cream precipitate, iodide = yellow precipitate $AgNO_{3(aq)} + X^-_{(aq)} \rightarrow AgX_{(s)} + NO_3^-$ (where X = Cl, Br or I)